

# THE IRON AGE

A Review of the Hardware, Iron, Machine and Trades.

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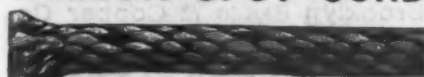


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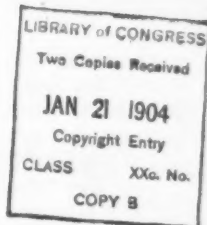
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# THE IRON AGE

THURSDAY, JANUARY 21, 1904.



## Philadelphia's New Fire Fighting Service.

### Central Pumping Station and Independent Pipe System Whereby High Pressures are Obtained Directly at the Hydrants.

To overcome the unreliability of the ordinary city water service for fire fighting purposes, and to obtain

amount and pressure of water required in the emergencies of large fires, but the increased demands incident to the construction of tall buildings were entirely unprovided for.

The new system provides separate mains utilized only for fire service, and a central pumping station located right in the district to be protected, and having the Delaware River as the source of its supply instead of the distant reservoirs.

The fact that the special mains were laid in the very



Fig. 1.—Stream Obtained Directly from One of the Hydrants.

higher water pressures than are obtainable from the regular steam fire engines, the city of Philadelphia has just completed the installation of an independent high pressure fire fighting service, which covers the congested business portion of the city. In this district the largely increased demands upon the regular water service have not only made it inadequate to supply the necessary

busiest section of the city made this work a rather protracted operation, which consumed a period covering more than two years. The construction of the pumping station necessitated further delay in the completion of the whole project. This is, however, now accomplished, and the entire system is now about to be turned over for active operation. While awaiting the completion of the central

pumping station the system was used by the substitution of fire boats, which pumped river water through the mains. The connections provided for this purpose are so arranged as to permit the supplementing by the fire boats of the completed system should occasion require it.

The results obtained by means of the pressure provided by the fire boats, which, although not as great as that obtainable from the central pumping station, is still considerably higher than that in the city mains, have proved conclusively the success of the project.

Recent tests have produced the results illustrated in



Fig. 2.—Twelve Streams Playing on One Point.—Taken from Two Hydrants.

Figs. 1 and 2, which show power of streams far beyond the possibilities of the ordinary steam fire engines, even when several engines are concentrated on one line of hose, according to the best modern practice. These tests were made under the supervision of the Board of Fire Underwriters, and the best evidence of their success was an immediate reduction of the insurance rates in the particular district covered by the system of 15 cents per \$100. If the increased efficiency expected by the system with the central pumping station in operation is attained a further reduction of 10 cents per \$100 in insurance rates is promised.

As the insured values in the district referred to represent a total of almost \$200,000,000, the value of the system to the business interests of Philadelphia will be seen to be very substantial. It is estimated that it will be possible to send four streams over Philadelphia's tallest building, and that a sufficient amount of water can be poured into a building to literally drown out any fire within half an hour.

These estimates are based on results already accomplished by means of the employment of the fire boats for pumping.

A very hot fire was recently encountered in a large five-story building at the corner of Eleventh and Race streets, containing straw board storage, paper boxes and other inflammable material. The alarm was given at 11 p.m. and the fire was extinguished at 11.30, the fire boat "Stuart" exerting its pressure within two minutes after the alarm was sounded and operating under a pressure of 150 pounds.

There were four lines of 3½-inch hose with 2-inch nozzles used, and after the extinguishment of the fire a single stream was kept on the debris and contents for some 16 hours. It is stated that the prompt response of the high pressure fire service on this occasion is deserving of the credit of the extinguishment of the fire and the fact that there was no extension beyond the building in which it originally occurred.

Previous to this a cotton and wool warehouse fire on Chestnut street, between Front and Second, was promptly extinguished, and similar results obtained on the occasion of the fire in the produce warehouse on North Delaware avenue.

At another warehouse the steel shutters were torn off of the building by means of the streams and the powerful columns of water stove large holes through the partitions of the building, enabling the firemen to direct their streams right into the heart of the fire immediately.

The system of piping as now constructed covers effectually about 425 acres in area. The location of the mains and connections is shown in Fig. 4. The amount and sizes of piping are as follows:

	Feet.
Walnut street, from Delaware River, 12-inch.....	6,519
Market street, from Delaware avenue, 12-inch.....	221
Market street, from Water street, 16-inch.....	5,979
Arch street, from Delaware River, 12-inch.....	6,210
Race street, from Delaware River, 12-inch.....	5,121
Juniper street, from Filbert to Arch streets, 12-inch.....	540
Broad street, from Walnut street to S. Penn Square, 12-inch.....	871
Around City Hall, 12-inch.....	2,248
Delaware avenue, from Market to Race streets, 8-inch....	1,446
Second street, from Walnut to Race streets, 8-inch.....	2,642
Fifth street, from Walnut to Race streets, 8-inch.....	2,642
Eighth street, from Walnut to Race streets, 8-inch.....	2,642
Eleventh street, from Walnut to Race streets, 8-inch.....	2,642
Fire hydrant connections, 8-inch.....	2,471

Total pipe laid.....42,194

The sizes given above are nominal. The external diameters conform to the standards used by the Water Bureau, and the internal diameters are reduced in proportion to the increased thickness of barrel necessary to give the required strength. Figs. 5 and 6 show the exact proportions of the piping and fittings used.

The straight and the curved pipes are of cast iron and are flanged at both ends, but owing to the former being

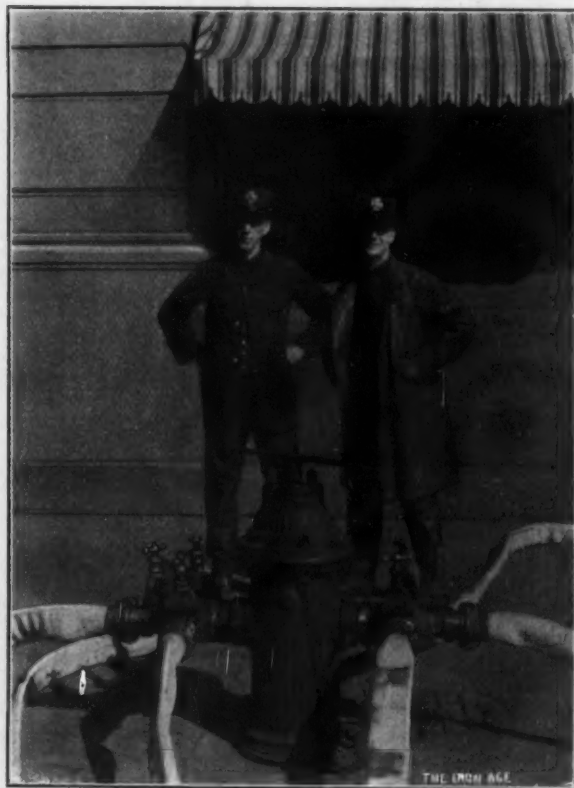


Fig. 3.—Special Hydrant with Siamese Connections for Six Streams.

cast vertically, the flanges on the cope ends of these pipes are reinforced with brackets.

All flanges are straight faced and spot faced around the bolt holes. The joints are packed with canvas, thoroughly coated with North Carolina tar, and cover the full width of the face of the flange.

The straight pipes are 12 feet in length; the curved pipes, for changing directions and passing obstructions encountered in the line of work, are from 8 to 16 feet radii, and the hydrant connections 19 inches radii, all of which vary in length from 1 to 8 feet, according to requirements.



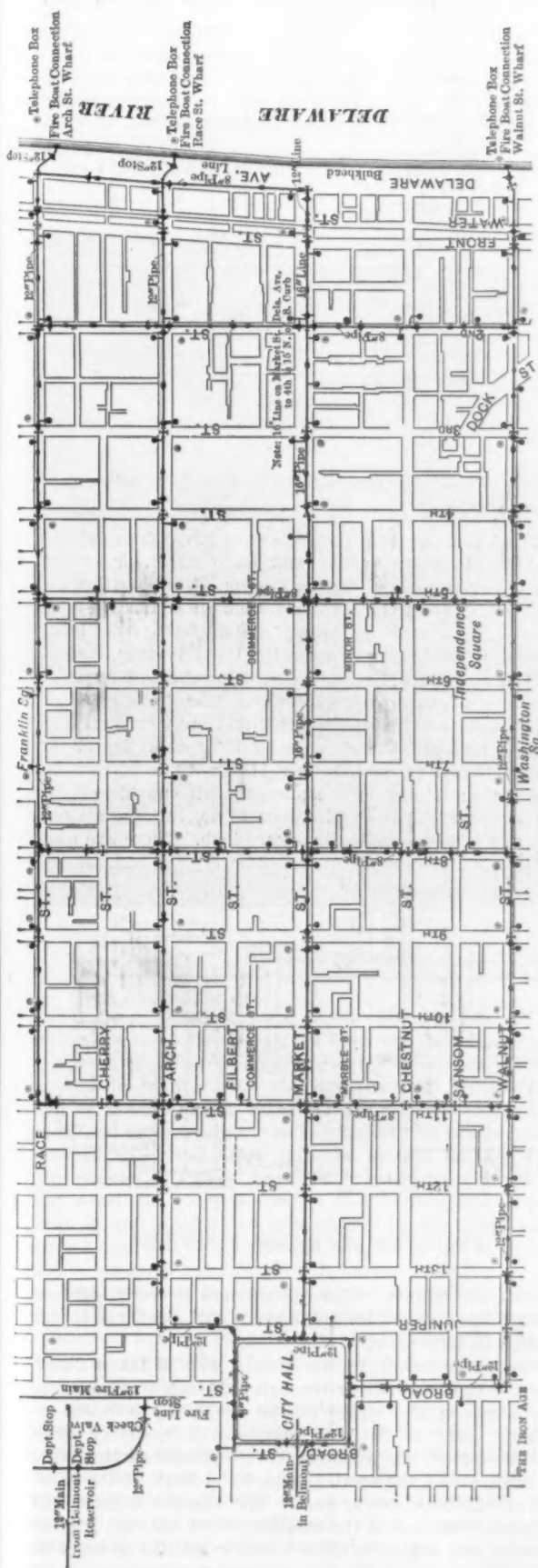
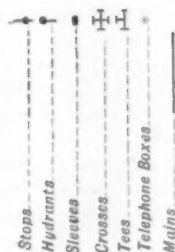


Fig. 4.—Map of District Covered by the High Pressure Pumping Service.

The dimensions of the pipes and bolts are as follows:

Pipe.		Flanges.		Bolt		Bolts.	
Size.	Internal diam.	External diam.	Thick- ness.	circle diam.	Diam.	Length.	
Inches.	Inches.	Inches.	Inches.	Inches.	No.	Inches.	Inches.
8	7 $\frac{1}{4}$	9	1 $\frac{3}{8}$	1 $\frac{1}{2}$	8	1	4 $\frac{1}{2}$
12	10 $\frac{11}{16}$	13 $\frac{3}{16}$	1 $\frac{7}{8}$	2 $\frac{1}{4}$	12	1 $\frac{1}{2}$	5 $\frac{1}{2}$
16	14 $\frac{1}{2}$	17 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	16	1 $\frac{3}{4}$	7 $\frac{1}{2}$

The crosses and tees for connecting laterals or inter-  
secting pipes are made of cast steel, and in all respects  
are of the same diameters as those given above for cast

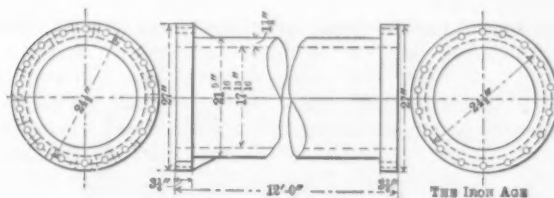


Fig. 5.—Details of Special Piping Used.

iron pipes, except that the interior diameters are greater  
and the thickness of the flanges is reduced, as follows:

8-inch interior diameter, 7 $\frac{1}{4}$  in.; thickness of flange, 1 in.  
12-inch interior diameter, 11 $\frac{11}{16}$  in.; thickness of flange, 1 in.  
16-inch interior diameter, 15 $\frac{1}{2}$  in.; thickness of flange, 1 $\frac{1}{4}$  in.

The gate valves are of the double disk pattern, with  
inside screws; the bodies are of semi-steel; the gates,  
valve seats and screws, of bronze; the 16-inch size being  
provided with by-passes, bolted to the body of the stop  
with flanged connections.

The piping and fittings were furnished by the Hoff-  
man Engineering & Contracting Company of Philadelphia  
at a cost of \$274,000.

The hydrants, one of which is shown in Fig. 3, are of  
the post pattern and were especially designed for this  
work by the A. P. Smith Mfg. Company of Newark, N. J.

Each hydrant is provided with two 4-inch nozzles,  
controlled by independent valves, and the main valve of  
the hydrant is a solid 8-inch single faced gate, all of  
the working parts being of bronze and so constructed  
that they can be taken out for repairs by removing the top of  
the hydrant. The body and gooseneck are of semi-steel.

There are at present 166 hydrants connected to the

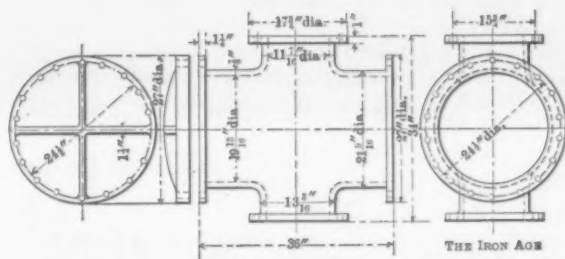


Fig. 6.—Details Showing Proportions of Fittings Used.

system, spaced on an average 300 feet apart, each fire  
plug having two 4-inch outlets. To each outlet can be  
attached a three-stream Siamese 3 $\frac{1}{2}$ -inch hose connection,  
giving a six-stream capacity to each fire plug. A gate  
valve is placed in the connection to each fire plug. Valves  
are also placed in the mains at every crossing, so that  
sections can be put out of service for repairs, and also,  
if desired, the pressure can be directed in the line from  
pumps to fire.

Two styles of expansion joints were used on the  
mains, one consisting of a solid sleeve with lead joints,  
such as is ordinarily adopted in water works practice for  
joining the bead, or cut ends, of cast iron water pipes,  
and the other, of which by far the greater number were  
used, was of the stuffing box and gland pattern, as shown  
in Fig. 8, in which square flax packing was used for  
making the joints water tight.

Brass air cocks, of the ordinary plug type, but made  
extra strong, are placed on all summits in the mains.

Brick chambers, with iron manhole covers, are con-

structed over all stops and expansion joints, so that repairs can be easily made and without unnecessary delay.

At the foot of Walnut, Arch and Race streets, the 12-inch pipes terminate in an enlarged bottle shaped chamber, which serves as a fire boat connection. This is 36 inches in diameter, the outer or river end of which is flanged, and to which is bolted a heavy plate, the latter being provided with eight 4-inch nozzles, as shown in Fig. 7. Each of these nozzles is controlled by a check valve within, and so arranged that no water can flow out of the chamber. Details of this check valve are shown in Fig. 8.

On top of the fire boat connection there is a 15-inch

ground wires with a central station at the City Hall, offers means of quick and direct communication by telephone between the pumping station or the fire boats stationed on the river front and the immediate vicinity of any fire which may occur within the boundaries covered by the independent fire mains.

In Fig. 4 the locations of the telephone boxes, piping, fittings and hydrants are shown, together with the three fire boat and pumping plant connections at the river end of the system, and the city reservoir connection and check valve at the opposite end, directly north of the City Hall.

The new central pumping station which has just been

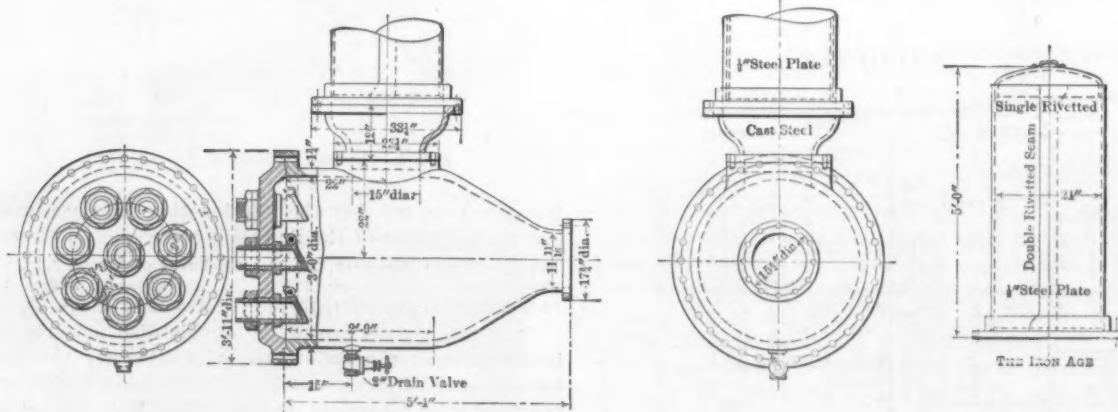


Fig. 7.—Siamese and Air Chamber Connection Whereby Eight Lines from the Fire Boat are Connected to One of the Mains.

flanged opening surmounted by an air chamber 24 inches in diameter and 6 feet high.

The fire boat connection is made of cast steel, the nozzle and check valves of bronze and the air chamber of  $\frac{1}{2}$ -inch steel plate.

All pipe and materials forming part of the fire main system were subjected to a hydrostatic pressure of 800 pounds to the square inch at the manufacturers, and to another test of 400 pounds to the square inch after being laid in the ground, in order to insure the integrity of the completed work.

The total cost of the materials consumed in the piping system was \$216,670. The cost of excavating was \$20,630, and the cost of laying the pipe \$90,670.

The system is maintained under a constant pressure of

completed is located on the Delaware River front at the corner of Delaware avenue and Race street, or in the northeast corner of the piping system. This location allows for the extension of the system in a northerly direction. A 20-inch pumping main, 1400 feet long, however, connects the pumps with the fire main system at Water and Market streets, delivering the water nearer the center of the present service. The building is a strictly modern structure of brick and steel construction one story high and 72 feet wide by 140 feet in depth. It is proportioned to contain ten  $11\frac{1}{2} \times 12$  inch vertical direct acting triplex Deane pumps, each capable of delivering 1200 gallons per minute at 40 revolutions, against a pressure of 300 pounds per square inch. There are also two  $6\frac{1}{4} \times 12$  inch pumps of the same type of 350 gallons

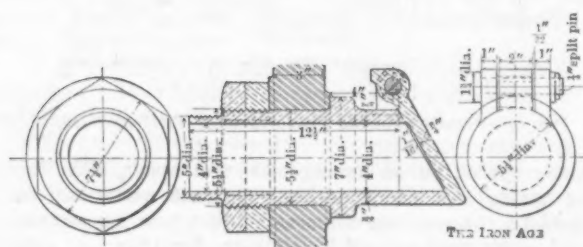


Fig. 8.—Details of Check Valve.

about 60 pounds to the square inch, by means of a 12-inch connection to the main which supplies the City Hall with water by gravity from the city reservoir.

The 12-inch connection is also provided with a check valve, similar to that shown in Fig. 8, which permits the water to pass into the fire mains, but not in the reverse direction.

The principal feature of the gravity supply is to keep the fire mains primed and ready for instant service at all times; but in addition to this it is useful for the extinguishment of incipient fires not exceeding 100 feet in elevation above the street level.

A complete system of fire boxes, connected by under-

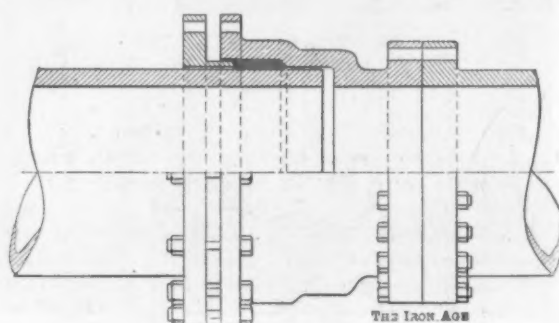


Fig. 9.—Type of Expansion Sleeves Used.

capacity per minute. These pumps are to work together or singly, as may be desired, and all will discharge into a common 20-inch main.

The water supply for the pumps will be taken direct from the Delaware River through a 36-inch suction main. Only seven of the larger pumps are being installed at present. Each of the large pumps will be driven by a 280 horse-power Westinghouse three-cylinder single acting gas engine, and the small pumps by engines of the same type of 125 horse-power each. The smaller engines will be direct connected to the smaller pumps through friction clutches, and will also drive electric ignition generators of 7.5 kw. each and the air compressors supplying air at



200 pounds pressure for starting the main engines. There are three sources of current for ignition, connections with the city lighting mains and a storage battery being provided in addition to the ignition generators. The lighting current is reduced from 220 to 110 volts by a rotary transformer. Cooling water for the gas engine cylinders may be taken from two different city water mains and from the fire mains. A gas pressure regulator on the supply pipe of each engine maintains the pressure constant.

Triplex pumps have been selected because of the even flow of the discharge, producing practically constant pressure on the discharge mains and making a very even load through all parts of the gas engine cycle. The crank shafts are driven from the engine shafts through single reduction gears. The fact that the pumps are of the vertical type makes it very easy to connect the pumps directly to the engines, and also results in a considerable saving in space.

Each pump is fitted with a by-pass valve and a relief

the specification. The valves are of hard rubber, especially suited for this work.

The machines were especially designed for fire service by the Deane Steam Pump Company of Holyoke, Mass., and are brass fitted throughout in order that they may be able to start after long periods of idleness. All of the moving parts, such as bearings, connecting rods, crank pin boxes, cross head shoes, &c., are adjustable for wear. The crank shafts and connecting rods are made of forged compressed steel, have large factors of safety and are much superior to the steel castings sometimes used for this purpose. The pinions are of steel and the gears are of steel castings, all very carefully cut by machine and running with very little noise. The pumps are very heavy in every particular and insure that every requirement on the pumping end of the equipment will be fully met.

The engines are started with compressed air in one cylinder with the relief valves on the pumps open. These

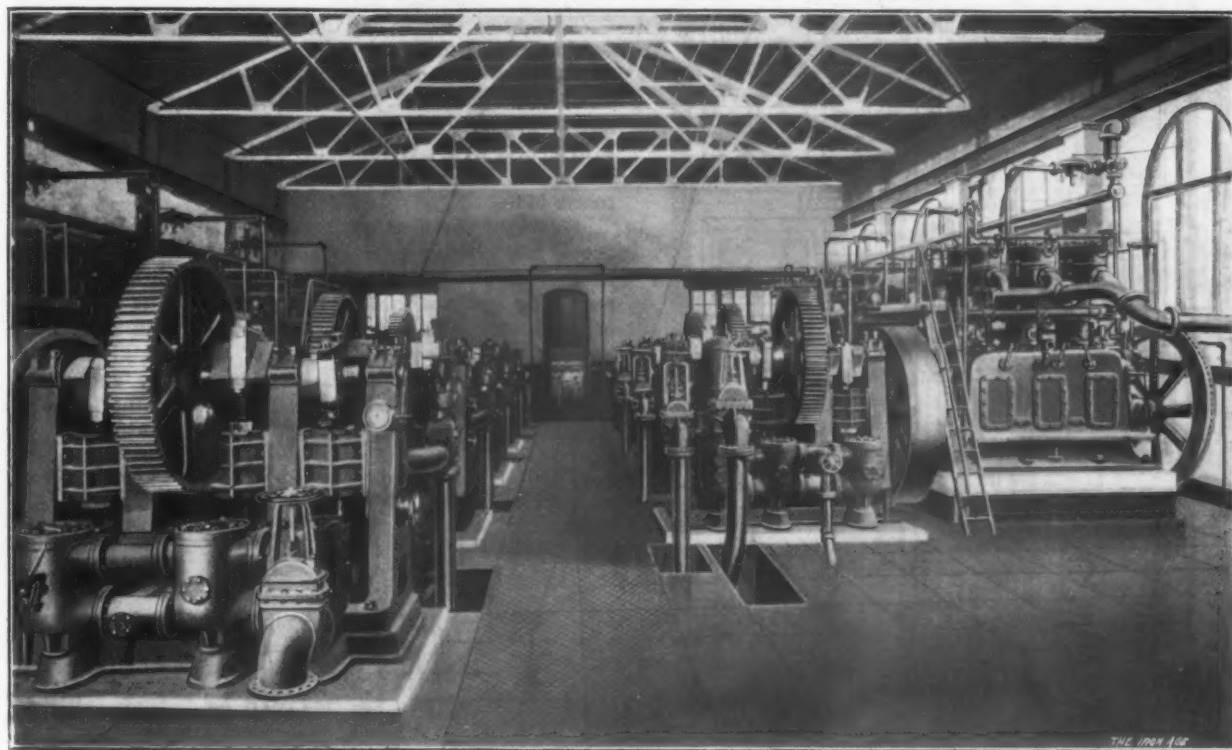


Fig. 10.—Interior View of Pumping Station.

valve, the manner of using these valves being well described in the following clause from the specifications:

"It is proposed to maintain about 60 pounds pressure on the fire mains from the city reservoir. The pumps will be started under these conditions with the by-pass open, and any surplus of water pumped will be discharged through the relief valve into the suction main. When the engine is under way the by-pass will be closed, and when the water is used as fast as this unit will deliver it its relief valve will close. In the meantime a second unit will be started and handled in the same way, and so on until the full plant is in operation."

The pressure in the fire mains is controlled automatically by an electric motor acting on the by-pass valve. It may be held steadily at any point under 300 pounds, while a spring relief valve prevents it from going above that point.

The water ends of the pumps are divided into sections; that is, each cylinder and valve chest is a separate casting and can easily be removed by itself without disturbing the other parts of the machine. This makes a very convenient arrangement in case repairs are ever required for the water end parts. The pumps have very large valve areas and are capable of a very much higher speed and much greater pressure than are called for in

valves are controlled by electric motors operated from the engine platform, one motor being on each valve. The entire work of operating the engines, pumps, and valves is under the immediate control of one person, who, from the gallery of the engine, without moving from his position, can open and close all valves by means of electrical devices.

The division of the pumping plant into comparatively small units presents an advantage in connection with the telephone communication with all parts of the fire district in increasing or decreasing the quantity of water required at a moment's notice.

The large engines are geared directly to the pumps through the spur gears without friction clutches, in the proportion of 5 to 1; this, with the moderate rate of piston speed of the engines, gives a slow piston speed to the pumps. The suction pipe of the pumps is riveted to a 36-inch steel suction main crossing Delaware avenue to the river, turning down at the bulkhead, and extending about 3 feet below tide, and provided with check valve and stop valve.

The selection of gas engines for motive power is novel, but is believed to be justified, in view of the perfection of the modern gas engine as regards reliability and freedom from breakdown. The great advantages incident to

the use of gas engines are their economy during periods of idleness as compared with steam plants and the ability to start up immediately and at full power.

In computing the comparative costs of operating the pumping plant by steam or gas engines the following de-

pouring upon the streets of the immense quantities of water necessary. Prominently associated with Chief Hand in the work of designing and installing the system were John E. Codman and John W. Weaver of the city's engineering force.

### The New England Foundrymen's Association.

The New England Foundrymen's Association held its annual meeting at the Exchange Club, Boston, Wednesday evening, the 13th inst., it being the date of the regular January meeting. There was a large attendance, notwithstanding that it rained in torrents, making travel exceedingly disagreeable.

These officers were elected:

President, Bartlett M. Shaw, the Walker & Pratt Mfg. Company, Boston, Mass.

Vice-president, John Magee, Magee Furnace Company, Chelsea, Mass.

Secretary, Fred. E. Stockwell, Barbour-Stockwell Company, Cambridge, Mass.

Treasurer, George H. Lincoln, George H. Lincoln & Co., South Boston.

Executive Committee: W. B. Snow, B. F. Sturtevant Company, Hyde Park, Mass.; J. O. Henshaw, N. S. Bartlett & Co., Boston; A. J. Miller, Jr., Whitehead Bros., Providence, R. I.; W. C. Doherty, Doherty Bros., Lowell, Mass., and J. F. Langan, Davis Foundry Company, Lawrence, Mass.

Following the election Henry A. Carpenter of Providence, the retiring president, who had declined re-election, after two years in the office, made a brief address, reviewing the growth of the association in its two years of existence, from 10 to 102 members, making it the banner foundrymen's association of the country, and so recognized in the industry. President Shaw and Vice-President Magee spoke of the great credit that should be given to Mr. Carpenter for his work in bringing the

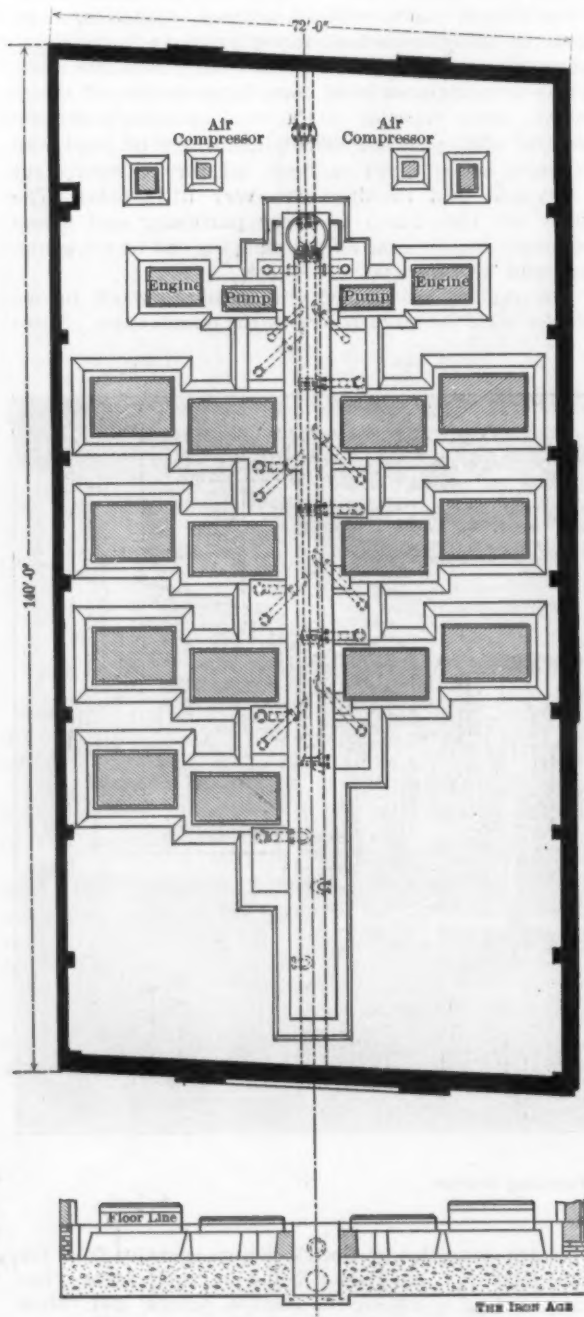


Fig. 11.—Foundation Plan of Pumping Station.

ductions were made, calculating on one fire of ten hours' duration per month:

	Steam engines.	Gas engines.
Number of engines.....	3	8
Number of boilers.....	8	.....
Cost of engines, boilers and stack.....	\$140,000	\$150,000
Total capacity in million gallons per 24 hours.....	15	16
Wages per month.....	\$650	\$450
Cost of coal per month.....	\$500	.....
Cost of gas per month.....	.....	*\$392
Oil, waste, &c.....	\$48	\$48
Repairs.....	\$85	\$85
Total cost per month, one ten-hour fire.	\$1,283	\$975
Cost per year, one ten-hour fire per month.....	\$15,396	\$11,700

\* Cost of gas for ten hours.

It will be noted that the actual saving accredited to the gas engine is considerable.

An elaborate series of tests will be conducted by F. L. Hand, chief of the Bureau of Water of Philadelphia, as soon as the weather moderates sufficiently to permit the

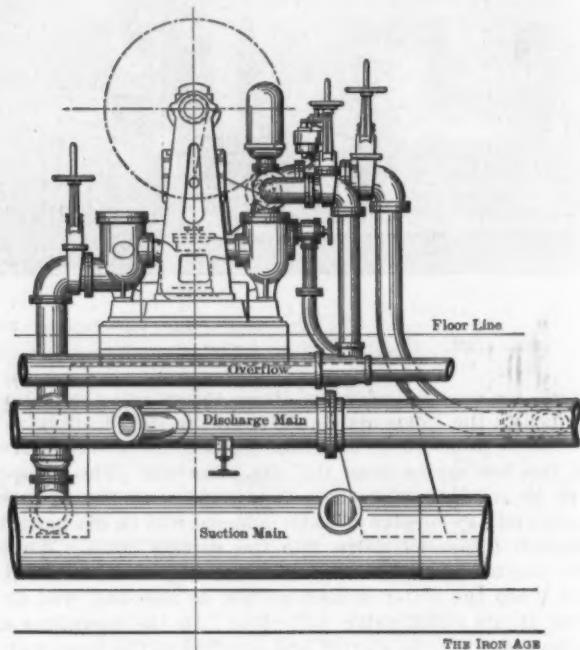


Fig. 12.—End Elevation of Pump, Showing Connections.

association to its present influential position. He was given a rising vote of thanks.

These new members were elected: Eaton, Cole & Burnham Company, Bridgeport, Conn.; Whiting Foundry Equipment Company, Chicago, W. A. Garrett, New England agent; Chicago Pneumatic Tool Company, James S. Towle, New England agent.

After dinner there were addresses by I. W. Frank, of the Frank-Kneeland Machine Company of Pittsburgh, Pa., president of the National Founders' Association, and O. P. Briggs, of the Twin City Iron Works, Minneapolis, Minn., commissioner of the National Association. Both



spoke along the lines of the Washington convention, paying particular attention to the uniform agreement, as recommended by the convention. Their remarks were listened to with great interest.

The New England Foundrymen's Association is taking a good deal of interest in the Foundry Exhibit Building at the St. Louis Exposition, and the members are ex-

importers of pig iron in San Francisco. To Meyer, Wilson & Co. he is indebted to the extent of more than \$200,000. To Balfour, Guthrie & Co. and Girvin & Eyre he owes about \$100,000. Mr. Church's present financial condition is due to the fact that he overestimated the capacity of the coast to consume pig iron. His three principal creditors likewise overestimated the market. In the last

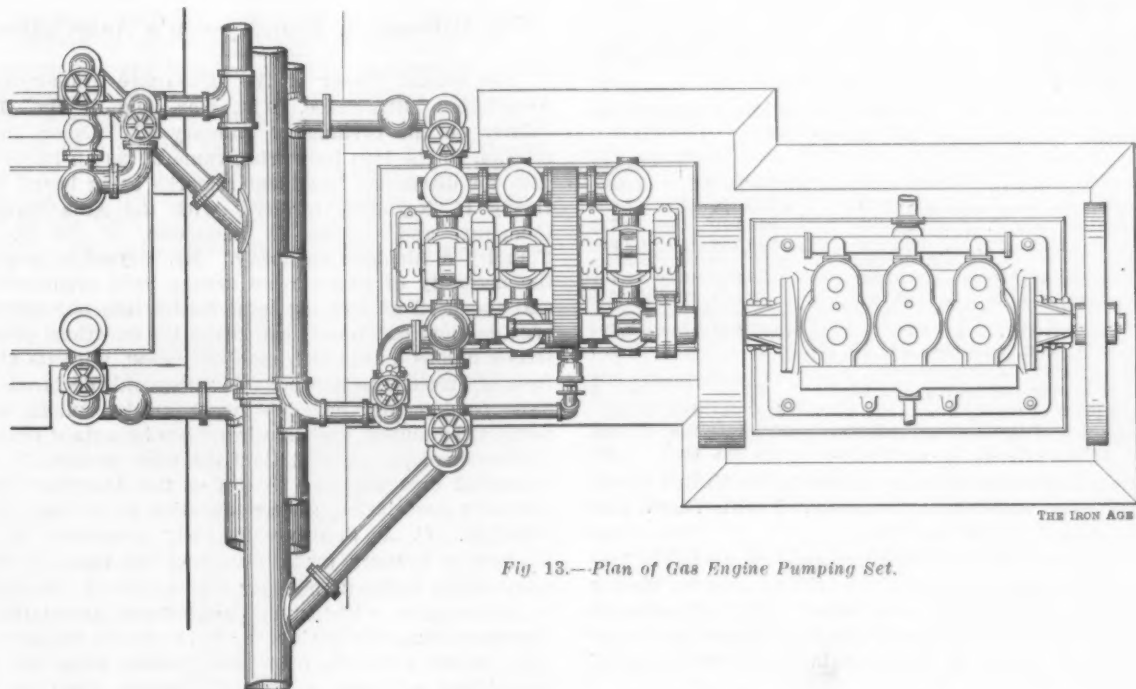


Fig. 13.—Plan of Gas Engine Pumping Set.

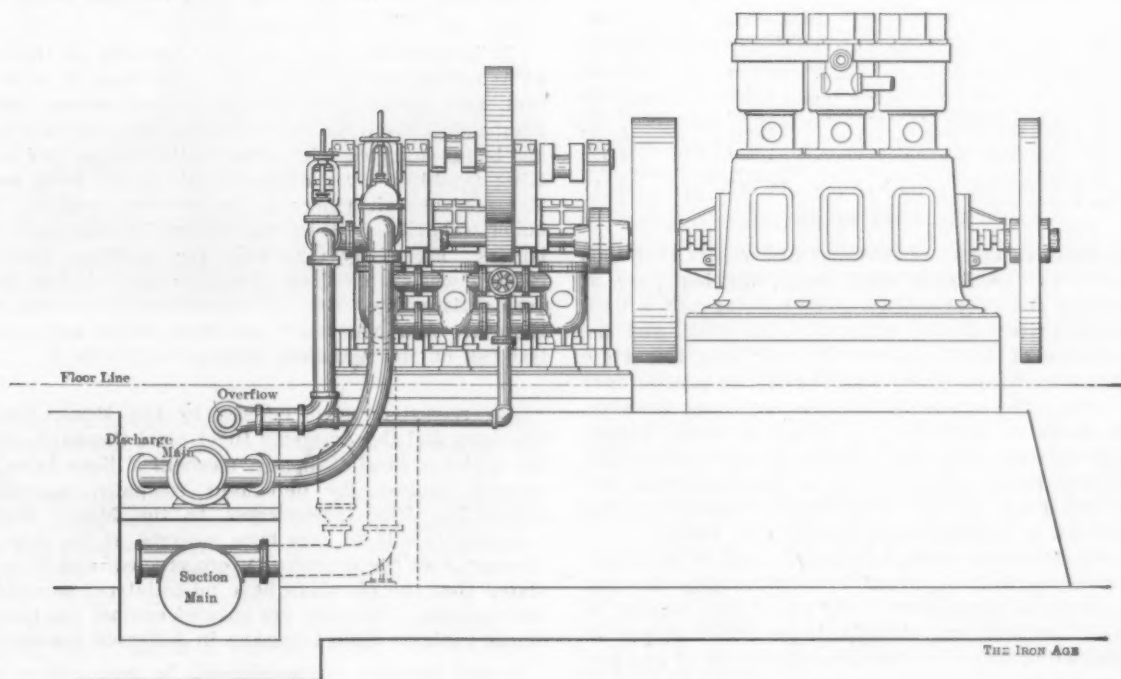


Fig. 14.—Front Elevation of Gas Engine Pumping Set.

pected to subscribe liberally to the necessary fund in answer to the general notice which each has received.

**Seymour R. Church Fails.**—A press dispatch from San Francisco, dated January 16, says: Seymour R. Church has failed for \$320,000. Three prominent firms from whom in the aggregate Mr. Church contracted to take 16,000 tons of pig iron, which he will now be unable to handle, are Balfour, Guthrie & Co., Girvin & Eyre and Meyer, Wilson & Co. These concerns are the principal

four or five years Mr. Church has had things his own way in local pig iron circles. Without difficulty he has practically maintained a corner of the commodity. He is now said to be very ill.

According to a Berlin press dispatch, the German government, after long experiments, has ordered turbine engines to be constructed for the German third class cruiser "Merkur" (formerly the "Arcona," of 2,373 tons displacement) and for a torpedo boat.

## Scotch Industrial News.

### Pig Iron Statistics.

GLASGOW, January 7, 1904.—The iron trade here is under holiday influences, all iron and steel works being still closed. Since my last letter the Scottish Pig Iron Trade Association have issued their report for 1903 on returns obtained from ironmasters and other sources. The Cleveland ironmasters do not make any returns either of production or of stocks held by them, but I am making up an estimate from information supplied to me, which I shall submit later. Meanwhile, I present the following summary of the production, consumption, shipments and stocks of Scotch pig iron:

	1903.—Tons.	1902.—Tons.	Change. Tons.
Production .....	1,288,073	1,295,074	Dec. 7,001
Consumption .....	923,465	956,219	Dec. 32,754
Shipments .....	323,904	386,758	Dec. 62,854
Stocks:			
In Warrant Stores...	9,290	24,035	Dec. 14,745
In makers' hands....	118,768	63,819	Inc. 55,449
Total stocks.....	128,058	87,854	Inc. 40,704
Furnaces in blast, December 31. 79		86	Dec. 7
Average number of furnaces in			
blast during the year.....	85	84	Inc. 1
Average price of G. M. B.....	52s. 3d.	54s. 6d.	Dec. 2s. 3d.
Highest price of G. M. B.....	57s. 6d.	58s. 4d.	Dec. 10d.
Lowest price of G. M. B.....	48s. 9d.	48s. 10d.	Dec. 1d.

The shipments of Scotch pig iron to the United States in 1903 were 40,296 tons as compared with 71,917 tons in 1902 and 2905 tons in 1901.

The warrant stock, which was reduced by 14,745 tons during the year, is now of so trifling amount that a Scotch iron warrant is becoming an object of curiosity in the avenues of commerce. Only fourteen years ago the warrant stores in Glasgow held 1,250,000 tons of G. M. B.

Following is a summary of the statistics of hematite iron of the Cumberland and Barrow districts:

	1903.—Tons.	1902.—Tons.
Production .....	1,333,900	1,382,100
Stocks:		
In makers' hands.....	83,188	22,314
In store at Workington.....	3,265	3,390
In store at Maryport.....	1,000	1,500
In store at Whitehaven.....	1,688	3,833
In store at Barrow.....	7,080	15,580
Total stocks.....	96,221	46,617

### The Steel Trade.

The Steel Company of Scotland Ltd. report that 1903 has been, in the Scotch steel trade, another year of fluctuations and uncertainties. The opening was not encouraging, prices of raw material being high, and the selling price of steel abnormally low; and this state of matters continued practically during the greater part of the year. The volume of business done was, however, almost equal to that of 1902. Business with British Colonies and the Far East has been well maintained. For Canada the company secured several important contracts, including one for the material required for the construction of a large penstock at Niagara Falls.

David Colville & Sons, Limited, Dalzell Steel & Iron Works, Motherwell, say that notwithstanding the dull prospects at the beginning of the year, their volume of business has been surprisingly large. The output of steel, including plates and bars, was in excess of any previous year. But the general trade of the country, taken as a whole, has been depressed by excessive competition, intensified by the importation of foreign manufactured steel, frequently sold in this country under the cost here of similar material. A feature of this competition has been the extensive purchases of foreign steel billets by malleable iron manufacturers, which enabled them to put into the market large quantities of steel merchant bars and small sections in direct competition not only with their own malleable iron bars, but also with home made steel.

### Shipbuilding.

The work done in the Clyde Shipbuilding yards during 1903 was, as expected, less than that of 1902. The total output was 277 vessels of 446,869 tons, as compared with 12 of 516,977 tons in 1902—a decrease of 35

vessels and 70,108 tons. The decrease is not serious, though it represents less work in the district than in the previous year and more idle men. The work done by Clyde shipbuilders last year included only 104 trading steamers. Thus of the 277 vessels less than half the number were additions to the freight carrying fleets of the world, though the largest share of the tonnage.

B. T.

### The Milwaukee Foundrymen's Association.

The annual dinner of the Milwaukee Foundrymen's Association, Milwaukee, Wis., was held at the Hotel Pfister on the evening of January 12. Labor, in its relation to the iron industries, came up as an important item for discussion, pertinent remarks being heard from Irving H. Reynolds, formerly with the Allis-Chalmers Company, and Charles E. Sammond, of the Stowell Foundry & Machine Company. Mr. Reynolds spoke of the necessity of co-operation among local organizations and the need of forming local bodies into one national organization, which only can resist the exactions of such strong unions as the iron molders' union, with its strike fund of \$250,000 to \$300,000. Mr. Reynolds declared that "the fundamental principle of all trades unions is to restrict the output, and this is a more important problem for the employer to meet than the wage question." Mr. Sammond presented the objects of the American Foundrymen's Association, giving education as its underlying principle. C. A. Sercomb, formerly prominent in the Milwaukee foundry trade, discussed the need of closer relationship between employer and employed. Frederick W. Sivyver gave a history of the National Association of Manufacturers, whose objects are to protect its members from unjust taxation, exorbitant freight rates and the impositions of trade unionism. Walter Read, of the Filer-Stowell Company was elected president to succeed T. J. Neacy of the same company, who had resigned.

It is estimated that the daily capacity of the docks at Ashtabula harbor will be increased from 25 to 30 per cent. next season over that of the past season. On the Hanna docks, on the Pennsylvania side, the fast hoists are being equipped with clam shell buckets, just as the King machines were equipped during the past season. The new electric power house is being enlarged. The boiler capacity will be augmented by two additional boilers. Electricity for power for operating dock machinery was installed about a year ago and has proved very satisfactory. On the Lake Shore side of the river there are four clam shell machines, which were erected last fall on the Ashtabula dock.

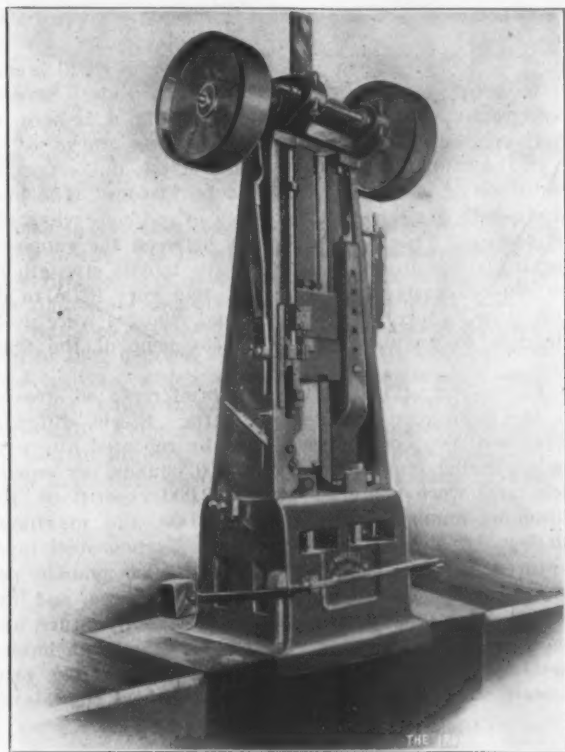
By reason of suits entered by the Mesta Machine Company and the American Ingot Mold Company against the Clairton Steel Company, mechanics' liens have been entered against the defendant company, aggregating \$23,055.71. The indebtedness to the Mesta Machine Company is said to have been incurred at the time that the works of the defendant were erected, and it is also stated that the plaintiffs have no collateral security for their claims. The liens are entered against the property of the Clairton Steel Company in Jefferson township.

The resumption at the Sharon Steel Company's rod wire and nail mills at South Sharon, Pa., on January 11, was not without spectacular features. It was the greatest day in South Sharon, perhaps, since it was a town. There were places for about 2000 men, but in the town, eager for work, there were fully 1200 Slavs, to say nothing of other nationalities. When the gates were opened these Slavs crowded into the mills and sought out their old locations. There was not work for half of them, and a force of 11 policemen was required to restore order and keep them away. It was after a vacation of five months, and all the labor of the town was most eager for employment. The blast furnaces and blooming mill, and about half the tin mills, have resumed, and in a short time the entire concern will be in operation, giving employment to as many more men, at least.



### A Heavily Built Drop Hammer for Cold Stamping.

Cold stamping is recognized as imposing extreme conditions which must be properly met in the design of a hammer which will successfully endure the heavy stresses repeatedly occurring and the severe strains thereby produced. Our illustration shows a board lift drop hammer involving practically all of the mechanical features of previous designs by the same makers, but supporting and housing these by and within excessively massive and heavy base and uprights. Comparison of the accompanying illustration with those of other machines of a similar type made by the same firm, as well as by other builders of drop hammers, shows that in the new design many unusual features are incorporated in the form and proportions of the base and the uprights. The mechanism for operation and control of



A HEAVILY BUILT DROP HAMMER.

the hammer is, however, scarcely changed except in such details as are made necessary by the altered form of the housing.

The particular line of work for which the redesign of this hammer was made is that of stamping from bronze and sheet steel various articles of high-class builders' hardware. The more familiar T-section of uprights has been changed in favor of a half box section with strong middle rib. The base, as already mentioned, is made very heavy, and is of increased depth front to back, giving in the case of the 1200-pound hammer here illustrated a bearing length of 24 inches for each of the uprights.

The total weight of the 1200-pound machine is 28,000 pounds. It is made by E. W. Merrill, Jr., 465 Kent avenue, Brooklyn, N. Y. The mechanical features of the hammers made by this company are familiar, and as they are practically unchanged in the new design, no special description of them is necessary. It may simply be recalled, however, that automatic features are provided, such that either light or heavy blows may be struck as the operator may desire, or a succession of heavy blows may be had without removal of foot pressure from the treadle.

The American Chamber of Commerce of Berlin, Germany, will celebrate its first anniversary on January 27.

The officers are Hermann Kreismann, president; F. Hessenberg, managing director of the Westinghouse, vice-president; Elmer Roberts, second vice-president, and J. Wolf, Jr., treasurer. The Board of Directors includes Julius A. Hutmacher, the Berlin representative of the McCormick Harvester Machine Company; W. F. Plass, of the American Machinery Company, and R. A. Panckow, an importer of American iron and steel.

### The American Car & Foundry Company Reduce Wages.

A reduction has been made in the wages of the officials and employees of the American Car & Foundry Company. About 5000 men are affected by the reduction. General Manager W. J. McBride makes the following explanation:

"The reduction was made because of a falling off in business, and because our competitors reduced the salaries of their employees. There has been no dissatisfaction ever the cut, however, the employees understanding why it was done. During the past three years wages have been raised from 25 to 33 1-3 per cent. The business prospect for the next few months is not so good, and the reduction comes naturally, in view of the previous increases. It will be only temporary. When business revives old wages will be restored. The officers of the company have voluntarily accepted a temporary reduction in wages also."

A reduction in the rate of the dividend on the common stock of the corporation was announced a few days ago, but Mr. McBride says the reduction in wages had nothing to do with this. The forces have been reduced at all the plants of the company, particularly in the freight car departments. The St. Louis World's Fair has occasioned considerable business in the passenger car department.

A \$3,000,000 mortgage has been recorded by the New Castle & Beaver Falls Street Railway Company in the counties of Lawrence and Beaver, in Pennsylvania, and it is likely that the 20 miles of line between Beaver Falls and New Castle will be constructed in 1904, just as soon as rights of way can be settled and enough bonds sold to construct the line. It will be the most important of the very few links remaining to be constructed in the direct line from Pittsburgh to Cleveland. Franchises have already been secured at Wampum Borough, south of New Castle, and at the new town of West Pittsburgh, and arrangements have been made for the entry into New Castle. It is almost certain that the next few years will see several new town sites opened along the new line.

A somewhat important novelty in the handling of the phosphoric slag from the basic process has lately been announced by Dr. Müller—namely, that by subjecting it to the action of steam under pressure for a few hours the lime is slacked and the mass is reduced to the fine powder required for agricultural use, thus doing away with the costly and unpleasant process of grinding now in use, with the further advantage that the proportion of phosphoric acid soluble in citric acid is increased from 2 to 2½ per cent., with a corresponding increase in its fertilizing value above that ground in the ordinary way.

The Post Office department is connecting its various postal stations in St. Louis with the main office by means of pneumatic tubes for the transmission of mail matter. The proposition to run a line across the Eads bridge to East St. Louis has received a temporary set back, the bridge owners stating that until certain repairs are completed next fall they do not think the bridge will stand the added weight of the tube. The power plants have not yet been installed.

W. J. Johnston has sold to H. M. Swetland of New York his stock in the Johnston Publishing Company, the corporation which owns the *Engineering and Mining Journal*. Mr. Johnston will devote his entire time to the *Pacific Coast Miner*.

## Tests of Metals at Watertown Arsenal

The report of tests of metals for 1902, recently published by the Ordnance Department of the Army, contains tests on materials for military and civil engineering purposes.

Tests of bronze are reported representing the metal in guns of early manufacture which showed a tensile strength of 39,000 to 47,000 pounds per square inch, with an elongation as high as 40 per cent. The so-called gun metal—88 Cu, 10 Sn, 2 Zn—is represented, also a mixture of copper and tin in the proportions of 90 and 10. These results, on the strength of metal cast in 1864, at a time when bronze held an important place in gun con-



Fig. 1.—Nickel Steel Ingot.

struction, probably represent maximum values for the mixtures shown.

There was a series of tests on puddled irons of different sizes and shapes. The strength is given for the metal in the state of merchant bars, also after treatment by sudden cooling from higher temperatures. Specimens, in triplicate, were heated to a full yellow; one was cooled in the air, one quenched in oil and one in water. A marked gain in strength accompanied the quenched specimens, which was more pronounced in the water quenched bars than in those cooled in the less energetic oil. Burden's best, which had a tensile strength of 50,120 pounds per square inch in the air cooled bar, rose to 61,360 pounds when quenched in oil and to 66,280 pounds when quenched in water. Norway iron was the least affected by treatment, although this iron advanced from 42,400 to 46,300 pounds by quenching in water. In respect to the elastic limits there was a vagueness in their definition in the suddenly quenched specimens; the jog in the stress strain curve shown by the air cooled specimens was absent in the others. The water quenched bars displayed a somewhat greater state of rigidity under loads above the elastic limit without reaching a condition of brittleness in the fracture.

Comparative tests were made on metal from two steel ingots, nearly alike in carbon, one of which contained 3.25 per cent. of nickel, the other none. The ingots were cut into slices, and some very spongy metal was disclosed. Illustrations, here reproduced in Figs. 1, 2 and 3, show a block as it appeared when taken from the ingot, after hammering on the several sides and after planing the surfaces and cutting apart. The effacement of these defects was nearly complete, the result of hammering at a forging heat. The report contains photo-micrographs showing the range in structure found in different parts of the ingot, and three views showing the diversity of structure displayed in the same test piece.

Tests were made with the metal in the natural state of the ingot and after treatment by heating and quenching at different temperatures, followed in some cases by annealing. In the carbon steel ingot, carbon 0.20, the metal had an elastic limit of 16,000 pounds and tensile strength of 54,000 pounds per square inch. After heating to a bright yellow and quenching in oil the tensile strength rose to 94,000 pounds. In this condition the elastic limit was not well defined, but became so upon annealing at 1000 degrees F., with a value of 48,000 pounds, the tensile strength having dropped to 76,000

pounds, the elongation being 11 per cent., and the contraction 41.9 per cent.

The companion nickel steel ingot, carbon 0.17, initially had a tensile strength of 66,000 pounds, which rose to 156,800 pounds after corresponding treatment of heating to a bright yellow and quenching in oil. The elastic limit was now vague, as in the carbon steel ingot. Annealing at 1000 degrees F. after treatment resulted in the properties being: Elastic limit, 74,000 pounds; tensile strength, 94,400 pounds; elongation, 19 per cent.; contraction, 57 per cent.

There were tests upon suspender rods from the New York and Brooklyn Bridge similar to those which were found fractured in the bridge in July, 1901. Incipient cracks were found along the threaded parts of these old rods at the roots of the threads, which are described in the report as having existed in the rods before testing, "fractures which were in progress in the bridge," and, furthermore, that they "were generally located at the extremities of the diameter which was parallel to the axis of the bridge, and seldom found on the sides taken crosswise the bridge." The position of the cracks was regarded as significant in explaining the causes which contributed to the ultimate failure of the rods. Several photographs accompany, one of which, Fig. 4, is here reproduced, showing the appearance of these cracks.

In the bridge "the direct tensile stress, under normal conditions of loading, is stated to be 11 tons." The lowest strength displayed in the series of old rods was 248,300 pounds. This great disparity between the supposed working stress in the bridge and the tensile strength of the rods suggests that the traffic had very little to do with their failure, and that thermal changes were quite adequate to account for the development of the fractures.

The report next gives the results of repeated stresses on the endurance of rotating shafts. Steels, differing in physical properties, were tested by repeated alternate loads ranging from 10,000 to 55,000 pounds per square inch, and were ruptured after 102,000 repetitions, the minimum number, to over 159,000,000, the maximum number. A shaft taken from a 0.20 carbon steel ingot ruptured at 800,250 repetitions of 20,000 pounds per square inch. The same metal, oil tempered and annealed, endured 9,000,000 repetitions without rupture, and was subsequently fractured under a higher load, having sustained in all over 10,000,000 repetitions. The tests showed that while repeated loads below the elastic

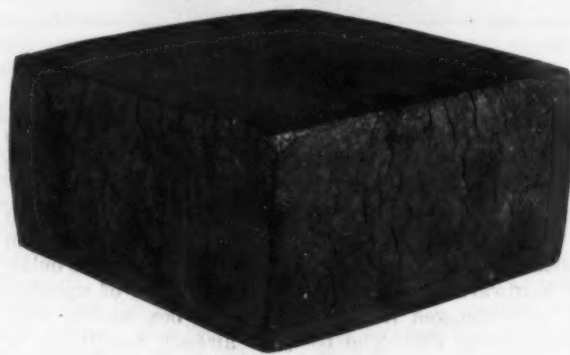


Fig. 2.—Nickel Steel Ingot, After Closing Cavities Under Hammer at Forging Heat.

limit may eventually rupture the metal, still it may have its endurance greatly increased by treatment which raises its tensile properties.

There were tests on building bricks, showing a comparison in strength, elastic properties, absorption of water, the rate and total quantity absorbed, according to the position of the brick in the kiln. A dry pressed brick from the top of a down draft kiln had a crushing strength of 10,300 pounds, against 3480 pounds for one which was taken from the bottom. There was a decided difference in the rate of absorption; after 12 seconds of time immersion in water, the former had gained 7.3 per cent. in weight, the latter 12.2 per cent. Corresponding figures for mud bricks showed a crushing strength of 19,170 pounds and 10,870 pounds, and a gain in weight after im-



mersion of 1 per cent. and 3.4 per cent. for the two positions in the kiln respectively. The extreme range in the modulus of elasticity was from 1,205,000 pounds pertaining to a dry pressed brick from the bottom of the kiln to 10,000,000 pounds per square inch for a mud brick from the top.

Tests on slate included transverse tests on roofing slates and stair treads, and compression tests on slabs and cubes.

Tests on Portland and natural cements were continued from the preceding year. Results were given on cement which set in air at zero temperature, immediately after gauging and corresponding material which set at a temperature of 70 degrees F., different intervals, and then ex-

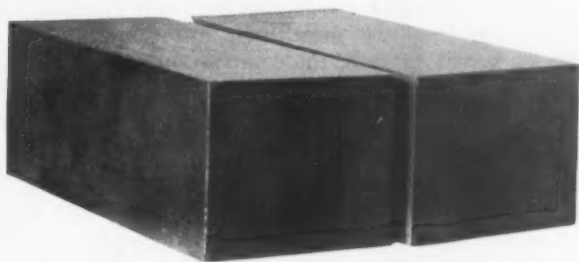


Fig. 3.—Nickel Steel Ingot, Surface Metal Planed Off and Piece Cut Apart.

posed to zero temperature. There was a marked retardation in the rate in which strength was acquired by the several groups of specimens, even when the initial period at 70 degrees was of several days' duration.

Samples of cement were raised to higher temperatures up to 1000 degrees F. Cracks appeared as the result of the heating, which in their early stages of development did not, however, materially detract from the crushing strength. Temperatures above 800 degrees generally resulted in lowering the strength. It was remarked that the immediate result of heating a number of cubes to

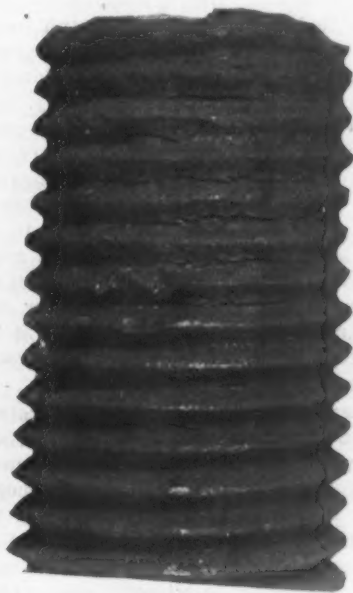


Fig. 4.—Rod from Brooklyn Bridge, Showing Incipient Cracks at Root of Threads Before Testing.

1000 degrees F. was the development only of some very fine cracks, which subsequently enlarged, and after a period of 11 days the disintegration had become general and of a pronounced order.

Transverse and shearing tests on Douglas fir and white oak woods were reported. Observations on heat conductivity were made upon the former. Sticks 10 x 10 inches square were placed over an open fire, having a temperature of 1380 degrees F., and the rise in temperature at the center of the stick observed by means of a mercurial thermometer inserted in a central bored hole. The temperature at the center of the stick remained practically unchanged for the first hour, during which time the out-

side continued to burn. After two and one-half hours' exposure to the flames the temperature at the center rose to 124 degrees from the initial temperature of 64 degrees. The outside of the stick was now quenched with water, the center, however, continued to increase in temperature, and reached a maximum of 215 degrees 1 hour and 20 minutes later. Waves of heat were transmitted to the center of the stick by reason of alternate periods of exposure to the fire and removals therefrom. Under reversed conditions a stick of the same size, as above, was placed in cold storage at 1 degree below zero. The temperature at the center remained unchanged for two hours. At the end of eight hours the temperature had dropped to 32 degrees, starting initially from 60 degrees. Compression tests were made on specimens turned down from the charred sticks, which showed normal strength in the wood below the parts which had been charred.

There were also tests on the adhesive resistance of lag screws and bolts in these two woods. The average resistance of the lag screws in the fir was about 800 pounds per square inch; in the oak 1200 pounds. Plain bolts, not threaded, in the fir gave a resistance of 600 pounds and in the oak 1100 pounds per square inch, referred in each case to the surface in contact between the bolt or screw and the wood.

### The New York Metal Trades Association

An interesting document has just been issued by Henry C. Hunter, commissioner of the New York Metal Trades Association, 203 Broadway, New York. It contains the names of the officers and members; the report of the commissioner for the year ending December 31, 1903, and copies of the agreements of the association with District Lodge No. 2 of the Seaboard Brotherhood of Boiler Makers and Iron Ship Builders of America, covering the year ending May 1, 1904; with District Lodge No. 1 of the Seaboard Brotherhood of Boiler Makers and Iron Ship Builders Helpers' of America, for the year ending May 1, 1904; with the American Association of Marine Steam Fitters, for the year ending January 1, 1905, and with Defender Union No. 1, American Brotherhood of Blacksmiths, and the Blacksmiths' Helpers' Union, for the year ending September 8, 1904. The commissioner's report gives an instructive history of the controversy during the past year with the blacksmiths, boiler makers, iron ship builders and machinists. He states that the association is co-operating with every employers' association of the State of New York in organizing a State federation of employers' associations. It has also taken upon itself the duty of forming a federation of city employers' association, and arrangements are being made for the officers of this association to meet monthly. The report concludes as follows:

Back of the words of this report are many days—yes, many weeks—devoted by men actively engaged in business, to solve the perplexing and serious troubles that from time to time have arisen, and which have threatened not only financial loss to the members affected, but industrial depression and decadence to the city of New York and vicinity. Out of confusion has come some order in dealing with conditions brought about by labor organizations. Lessons have been taught to labor men that success in business, either on the side of labor or capital, depends upon principles, moral and economic, that cannot be violated even by resolutions of labor organizations without bringing loss and suffering to them and to their employers. The open shop has been established and is maintained; the sympathetic strike and minimum wage have been eliminated; more amicable relations between employer and employee have been brought about; a more intelligent and honest appreciation of the obligations of a contract have been learned by workmen and confidence has been established between the two parties to production, all of which portends highest good for manufacturer and workmen and for industrial welfare.

A remarkable performance is reported on one of the 18 feet 6 inch gap hydraulic riveting machines made by William H. Wood of Media, Pa. There were riveted up with it 850 tanks for the transportation of oil on railroad cars in exactly two years time. These tanks are about 31 feet long and 84 inches in diameter, and are used by the Standard Oil Company of New York in the transportation of oil, and are made at their Atlas Works, in Buffalo, N. Y.



## The Manufacture of Iron and Steel Rails in Western Pennsylvania.\*

BY JAMES M. SWANK.

In the manufacture of iron rails Western Pennsylvania was prominent in the early days of American railroads. At Brady's Bend, on the Allegheny River, in Armstrong County, the Great Western Iron Works, embracing four furnaces and a rolling mill, were commenced in 1840 by the Great Western Iron Company, composed of Philander Raymond and others. The rolling mill was built in 1841 to roll bar iron, but it afterward rolled iron rails, which were at first only flat bars, with holes for spikes countersunk in the upper surface, and in 1846 and afterward it rolled T-rails. In 1856 it made 7533 tons of rails. It was one of the first mills in the country to roll T-rails, our first rails of this pattern having been rolled in 1844 at the Mount Savage Rolling Mill, in Maryland. The Brady's Bend mill continued to make rails until after the close of the Civil War. In October, 1873, it ceased operations. Shipments of rails were made by the Allegheny River. In 1849 the Great Western Iron Company failed and the Brady's Bend Iron Company took their place. The mill and the furnaces have long been abandoned and have gone to decay. In the *Railway Age* of Chicago for April 3, 1903, there appeared the following interesting reminiscence of the Brady's Bend enterprise, contributed by G. W. P. Atkinson:

The Allegheny Valley Railroad in 1865 operated only 44 miles from Pittsburgh to Kittanning. It is now part of the Pennsylvania system. At that time steamers ran up the Allegheny River from Pittsburgh to Franklin when there was water enough. There was a rail mill at Brady's Bend in 1865, with which the writer was connected, and which during the war made a great deal of railroad iron. William B. Ogden, Chicago's first Mayor, was president of it, and the writer had charge of its sales. If the river was not navigable for steamers we had to take the stage from the Kittanning end of the Allegheny Valley Railroad to Brady's Bend, and a tough ride it was. The writer and William B. Ogden made the trip several times together. Rails were shipped by river in barges to Pittsburgh or Cincinnati. In the fall of 1865 the writer shipped 2000 tons of rails for the Nashville & Chattanooga Railroad (which was run by the Government during the war) from the Brady's Bend mill in barges down the Allegheny and the Ohio rivers and up the Cumberland River to Nashville. It took about six weeks to reach Nashville. As one passes East Brady Station to-day on the Allegheny Valley Railroad the tall stack of the rolling mill is visible on the opposite side of the river, all that is left of the once busy town of Brady's Bend, with 3000 people. [The stack was torn down in 1903.]

In 1853 the Cambria Iron Works were built at Johnstown, in Cambria County, by the Cambria Iron Company, expressly to roll T-rails, George S. King being the leading member of the company and the originator of the enterprise. Within a year the works were making rails. Several charcoal and coke furnaces were connected with these works. In 1856, under new management, they made 13,206 tons of rails, and their production was afterward increased. For almost 29 years, beginning with 1855, Daniel J. Morrell, who died in 1885, was the successful general manager of these works. In 1871, through his persistent advocacy of steel rails, their manufacture was added to that of iron rails, in which branch of the steel industry these works have ever since been prominent. John Fritz, the distinguished engineer, is entitled to the credit of having made the manufacture of iron rails at these works a conspicuous success, accomplished chiefly through his introduction of three-high rolls in 1857; while his brother, George Fritz, also distinguished as an engineer, successfully superintended the introduction at the same works of the Bessemer process and the manufacture of Bessemer steel rails. In 1898 the works were leased to the Cambria Steel Company, who now operate them.

In 1865 the Superior Iron Company built the Superior Rolling Mill at Manchester, in Allegheny County, to make iron rails. Connected with this mill were two coke furnaces, built in 1863. The company operated the works until September, 1867, when they were leased by Springer Harbaugh. On January 1, 1870, Harbaugh, Mathias & Owens took possession as owners, and on August 1, 1874, they failed, when the manufacture of rails was aban-

doned. The works themselves have long been abandoned. A few other iron rail mills in Western Pennsylvania, including those which were equipped for the manufacture only of mine rails and other light rails, need not be mentioned. Of these mills those which made rails of heavy sections never at any time produced any considerable tonnage. It is a noteworthy fact that Allegheny County, with all its enterprise in the manufacture of iron and steel, did not begin to make rails of heavy sections until the Superior Rolling Mill was built in 1865.

Iron rails are not now made in Western Pennsylvania, except occasionally a very few tons of light rails for lumber and mine roads.

Much of the progress of this country in the manufacture of Bessemer steel rails has been due to the enterprise displayed by Andrew Carnegie at the Edgar Thomson Steel Works, at Braddock, near Pittsburgh, the site of Braddock's defeat in 1755, the construction of which works was undertaken in 1873 and completed in 1875 by a company of whom Andrew Carnegie was the leading spirit and of whom his brother, Thomas Carnegie, who died in 1886, was a member. Andrew Carnegie was the leading stockholder in the company. These works were built expressly to make Bessemer steel rails. The first Edgar Thomson steel rail was rolled on September 1, 1875. At first only a Bessemer plant and a rolling mill were built, but in 1879 the erection of large blast furnaces was commenced. Until these furnaces were built the Edgar Thomson steel plant was largely supplied with pig iron from the two nearby Lucy Furnaces, built respectively in 1872 and 1877, and owned in 1875 and subsequently by Carnegie Brothers & Co.

From year to year Mr. Carnegie steadily increased the capacity of the Edgar Thomson Works, and thus cheapened the cost of producing rails. From the first he had unbounded faith in the future of the steel rail; he knew that its general substitution for the iron rail on American railroads was sure to come at an early day. He foresaw this evolution and fully prepared for it when experienced manufacturers and even many railroad officials continued to praise the iron rail. Hence, when others were timid or neglectful of their opportunities, he introduced at the Edgar Thomson Works from time to time the best and most economical methods of manufacture; the blast furnaces at these works were the best in the country, the Bessemer converters were the largest and the rail mill was the swiftest; so that, when an extraordinary demand for steel rails would come, as it often did come, he was fully prepared to meet it and at a lower cost than that of his competitors. He had business foresight in an eminent degree; he had unfaltering courage; and more than all his contemporaries he believed in tearing out and making a scrap heap of even modern machinery when better could be found. The best engineering talent in the country was engaged to bring the Edgar Thomson Works up to the highest possible state of efficiency.

These characteristics were again illustrated when Mr. Carnegie and his partners in the firm of Carnegie, Phipps & Co. succeeded to the ownership of the Homestead Steel Works in 1883, and again in 1890 when Carnegie Brothers & Co., then operating the Edgar Thomson Works, succeeded to the ownership of the Duquesne Steel Works, with the result that steel in other forms than rails has been greatly cheapened to all consumers. This lowering of prices was accomplished through the use of the best mechanical appliances and the production of the largest possible tonnage. At the Edgar Thomson Works Mr. Carnegie set the pace for a large annual tonnage of steel rails, and this policy was afterward applied to the production of pig iron and other products. His American competitors were soon compelled to abandon their conservative ideas and to enlarge the capacity and increase the efficiency of their works. And he has compelled Europe to revise in a large measure its metallurgical practice and also to cheapen its prices for all steel products. It has freely copied the devices and processes which his engineers, with his encouragement, had introduced or perfected. Of the engineers referred to, Mr. Carnegie's first superintendent at the Edgar Thomson Steel Works, Capt. William R. Jones, whose tragic death occurred in 1889, is entitled to special mention. To these engineers and to

\* Extracts from an article in the January issue of the *Pennsylvania Magazine of History and Biography*, published by the Historical Society of Pennsylvania, Philadelphia.

his "young partners" Mr. Carnegie has always acknowledged that he was under great obligations.

Mr. Carnegie's distinguished and remarkable career as an iron and steel manufacturer, which conspicuously began on the threshold of the fourth quarter of the nineteenth century, when the Edgar Thomson Works were first put in operation, although he had previously been identified with our iron industry, may be said to have ended immediately after the close of the century, in February, 1901, when he transferred the ownership of all the iron and steel properties and auxiliary enterprises in which he had a controlling proprietary interest to the United States Steel Corporation. Soon afterward, in 1902, he was chosen president of the Iron and Steel Institute, whose membership is not restricted by political or geographical lines, but which has its home in Great Britain, and he presided over its deliberations at the spring and autumn sessions of 1903, at London and Barrow respectively, on each occasion delivering an address. Mr. Carnegie was the first American to receive this honor. No higher honor can be conferred upon any iron and steel manufacturer, wherever his home may be, than to be elected to the presidency of the Iron and Steel Institute.

The great success of the Edgar Thomson Steel Works and of other Bessemer steel plants in the United States led to the erection in Allegheny County of two competing steel works, noticed above: the Homestead Steel Works, which were completed and put in operation in 1881, and the Duquesne Steel Works, which were undertaken in 1886 and put in operation in 1889. Both these works were built to make Bessemer steel, but, while the Homestead Works were erected to make miscellaneous steel products, including rails, the Duquesne Works were built to make rails only. The Homestead Works rolled their first steel rail on August 9, 1881, and the Duquesne Works rolled their first steel rail in March, 1889. Down to their absorption by Carnegie, Phipps & Co. in 1883 the Homestead Works rolled in all about 125,000 tons of rails, and down to their absorption by Carnegie Brothers & Co. in 1890 the Duquesne Works rolled in all about the same number of tons, all, or nearly all, of the rails rolled by both works being of heavy sections. Since the changes in ownership above noted these works have not made many rails. The Homestead Works have not made any rails since 1894, and the Duquesne Works have not made any since 1892. The Homestead Works were built by the Pittsburgh Bessemer Steel Company, and the Duquesne Works by the Allegheny Bessemer Steel Company.

The prominence of Western Pennsylvania in the manufacture of steel rails to-day is best shown by a reference to the statistical record. In 1902 the whole country made 2,935,392 tons of Bessemer steel rails, and of this large production Western Pennsylvania made 950,266 tons, or nearly one-third of the country's total production. This large tonnage was almost entirely rolled at the two works above mentioned, the Edgar Thomson and the Cambria Works, operated respectively by the Carnegie Steel Company and the Cambria Steel Company, less than 3000 tons having been rolled by the Jones & Laughlin Steel Company, who have never made the manufacture of rails a leading specialty.

The first 30-foot rails ever rolled in this country are claimed to have been rolled at the Cambria Iron Works in 1855. These rails were perfectly made, but there being no demand for them they were used in the company's tracks. In 1876 these works rolled the largest aggregate tonnage of rails that had been rolled in one year by one mill in this country up to that time. Their production of rails in that year was 103,743 net tons, of which 47,643 tons were iron rails and 56,100 tons were steel rails.

The first 60-foot rails ever rolled in this country were rolled at the Edgar Thomson Steel Works in the fall of 1875. At the Centennial Exhibition at Philadelphia in 1876 the Edgar Thomson Steel Company exhibited a steel rail which at that time was the longest steel rail that had ever been rolled. It was 120 feet long and weighed 62 pounds to the yard.

The Republic Iron & Steel Company have posted notices at their blast furnaces, rolling mills and Bessemer

steel plant at Youngstown, Ohio, notifying labor not controlled by the Amalgamated Association of a reduction in wages. The notices instructed the men to call on the foremen of their respective departments to learn the new wage rate.

### Lake Shipbuilding Interests.

The past year has been a record breaker for the shipbuilding interests of the Great Lakes. Not a season in the history of the industry can compare with it either in the amount of tonnage or the number of vessels that have been added to the lake marine. The American Shipbuilding Company, Cleveland, Ohio, launched 42 vessels; the Craig Shipbuilding Company, Toledo, Ohio, three; the Columbia Iron Works, St. Clair, Mich., one and the Jenks Shipbuilding Company, Port Huron, Mich., one, making a total of 47. The carrying capacity of the new vessels showed a marked tendency toward larger boats. The average of the vessels built by the American Shipbuilding Company was 6000 tons carrying capacity, the largest vessel having a capacity of 7800 and the smallest 2500 tons. A marked change is being made in the style of the boats, as some of them were constructed to conform to the requirements of rapid unloading plants with which nearly all modern docks are now being equipped.

That the lake vessel has not yet reached its maximum size is evidenced by the fact that the American Shipbuilding Company have under construction, at Lorain, Ohio, a boat which will be the largest on the lakes. It will be 560 feet over all and will have a carrying capacity of 10,000 tons. It will be of a new design known as a hopper boat, being without stanchions in the cargo hold, and 12 foot center hatches will afford the new automatic clam shell unloaders free access to the entire cargo.

In view of the remarkable increase in tonnage last year, together with the feeling of uncertainty as to industrial activity throughout the country the coming season, it is not difficult to appreciate that the contracts for next season's new tonnage show a marked falling off from the figures of last year at this time. While it is possible that more contracts will be closed in the near future, it is hardly probable in view of the reasons above mentioned, and the fact that labor conditions are unsatisfactory, making it impossible for shipbuilders to guarantee deliveries. At the present time the American Shipbuilding Company have under construction seven vessels. One of these is the large ore boat mentioned, another an 8000 ton package carrier and another a large passenger steamer. The Craig Shipbuilding Company are building a 6000 ton freighter, a large side wheel passenger steamer and two steel tugs. The Great Lakes Engineering Company of Detroit are building a 5500 ton freighter. At the plant of the Columbia Iron Works, who at present have suspended operations on account of financial difficulties, two 6500 ton boats are being built for the Gilchrist of Cleveland.

The annual banquet of officials and heads of departments of the Carnegie Steel Company was held in the Duquesne Club, Pittsburgh, on Saturday evening, January 9. William E. Corey, formerly president of the Carnegie Steel Company, and now president of the United States Steel Corporation, was presented with a testimonial of solid silver, an exact copy in miniature of the forging press, designed and installed by Mr. Corey in the Homestead Steel Works when he was superintendent of that plant. George E. McCague, formerly traffic manager of the Carnegie Steel Company, but who resigned recently, was presented with a very handsome picture. James H. Reed acted as toastmaster, and a number of speeches were made.

A receiver has been appointed for the Pacific Steel Company of Port Townsend, Wash., following the death in the steamer "Clallan" wreck of Homer H. Swaney, president of the company. The receiver was appointed by the Federal Court on application of the First National Bank of Seattle, to which the company owes \$23,000.



A New 48-Inch Triple Geared Engine Lathe.

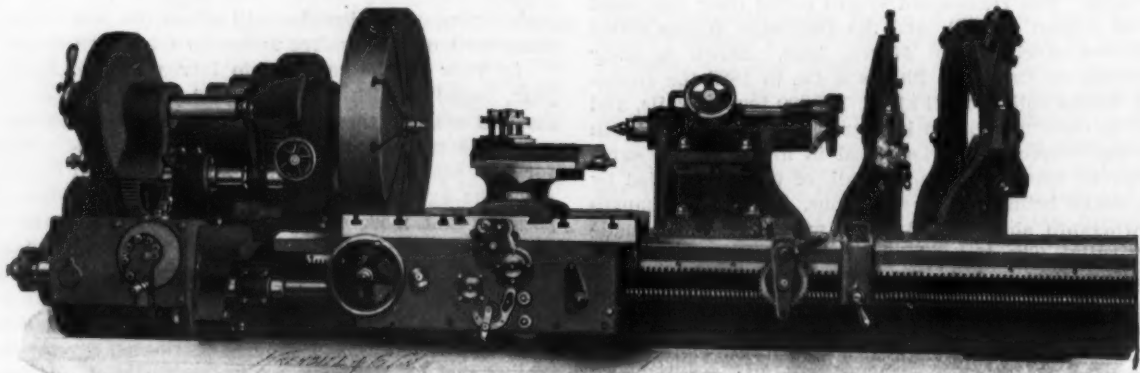
A new design of engine lathe, of very heavy construction and equipped with triple gearing, instantaneous feed change gear box and various other features representative of the latest improvements in lathe design to meet the modern requirements of high duty service, is shown in the illustration. This lathe swings 34 1/4 inches over the carriage and 50 inches over the bed, although nominally designated as a 48-inch machine. Fitted to the spindle is a five-step cone, which may drive the spindle directly or through back gears of the usual type. The triple gear pinion meshes into an internal gear at the back of the face plate. The tool is thus heavily geared for meeting the most exacting requirements of modern machine practice. All gears, from the cone pinion to the internal face plate gear used in connection with the triple gears, are cut from steel, as are also all gears about the lathe. As shown in the engraving, neat and effective guards are provided for all exposed gears, practically incasing them, and protecting them as well as the operator from injury. The spindle is hollow, of crucible steel, the hole through it being 3 1/4 inches in diameter.

The tail stock is very heavy, and is fitted with a pawl engaging a rack in the lathe bed, so as to secure it positively in position. The traverse of the tail stock lengthwise of the bed is effected by a hand crank connected by compound gearing to the rack underneath the front edge of the bed, as clearly shown in the illustration. The tail stock spindle is advanced and withdrawn by means of a cranked hand wheel, seen at the top of the tail stock. Its connection to the spindle is through bevel gears to a short

for the various lengths of bed, the over all length thus being 1 1/2 feet greater than the length of the bed. The builders are Schumacher & Boyé, Cincinnati, Ohio.

SCHUMACHER & BOYÉ, CINCINNATI, OHIO.									
THREAD CUTTING.									
Gears.		Threads per Inch for Handle in Holes.							
Stud.	Screw.	1	2	3	4	5	6	7	8
80	24	1	1½	1¾	1⅞	1 <sup>7</sup> / <sub>16</sub>	1⅞	1⅞	1¾
80	48	2	2¼	2½	2¾	2⅞	3	3¼	3½
80	96	4	4½	5	5½	5¾	6	6½	7
40	96	8	9	10	11	11½	12	13	14
FEEDS.									
Stud.	Screw.	Compound.		Lead.	Feeds 3¼ Times Threads per Inch for				
		Screw.	Stud.						
80	24	108	54	1½	Handle in Hole—6.				
80	24	108	54	2	Handle in Hole—1.				

Under the title of "Practical Lessons in Electricity," the American School of Correspondence, at the Armour



A NEW 48-INCH TRIPLE GEARED ENGINE LATHE.

shaft driving the spindle screw through the spur gearing at the rear end of the tail stock.

The carriage is long, bears throughout its length upon the V's of the bed, and is gibbed front and back to insure permanence of alignment. To the carriage is fitted a compound rest having power feed 14 inches in length at any angle. The apron is double. The half nut for engaging the lead screw in screw cutting is of phosphor bronze.

The lathe is equipped with the makers' patent instantaneous change gear box, by means of which any pitch or feed within the range provided is instantly obtainable. The range of feeds and leads for screw cutting is given in the table, which is essentially a reproduction of the index plate attached to the machine. From this table it appears that threads from 1 to 14 per inch may readily be secured, including the mongrel 11 1/2 per inch used on piping.

Lengths of bed from 16 to 36 feet are made, advancing by 2-foot intervals. These lengths of the bed correspond to approximately 7 to 27 feet lengths of work which may be swung on the centers. For bed lengths of 16 to 22 feet one intermediate foot is provided; for 24 to 28 foot lengths there are two such intermediate feet, and three are provided for bed lengths of 30 to 36 feet inclusive. The floor space required is 5 feet 3 inches from front to rear, and from 17 feet 6 inches to 37 feet 6 inches

Institute of Technology, Chicago, Ill., has issued four of the 45 regular text books used in the electrical engineering course of the school, bound together in convenient form and finely printed and illustrated. These comprise "Elements of Electricity" and "The Electric Current," by L. K. Sager; "Electric Wiring," by H. C. Cushing, Jr., and "Storage Batteries," by F. B. Crocker, head of the electrical department of Columbia University. The purpose of the volume is to give the public an opportunity to judge of the standard and the scope of the instruction offered, the elementary instruction being illustrated by the first half, and the advanced instruction by the second half of the book. While issued primarily to demonstrate the character of the text books of the school, the volume has in itself enough practical information to make it a valuable addition to the library of the electrician, be he expert or beginner.

The largest steel plates ever made in America have recently been rolled by the Worth Brothers Company, Coatesville, Pa. The plates are to be used in the construction of marine boilers, and are 139 x 181 inches in size and 66-100 inch thick. They were rolled on the company's new 152-inch mill, which is the largest as well as the most modern plate mill in the country.



### Apex Pipe Threading and Cutting Machines.

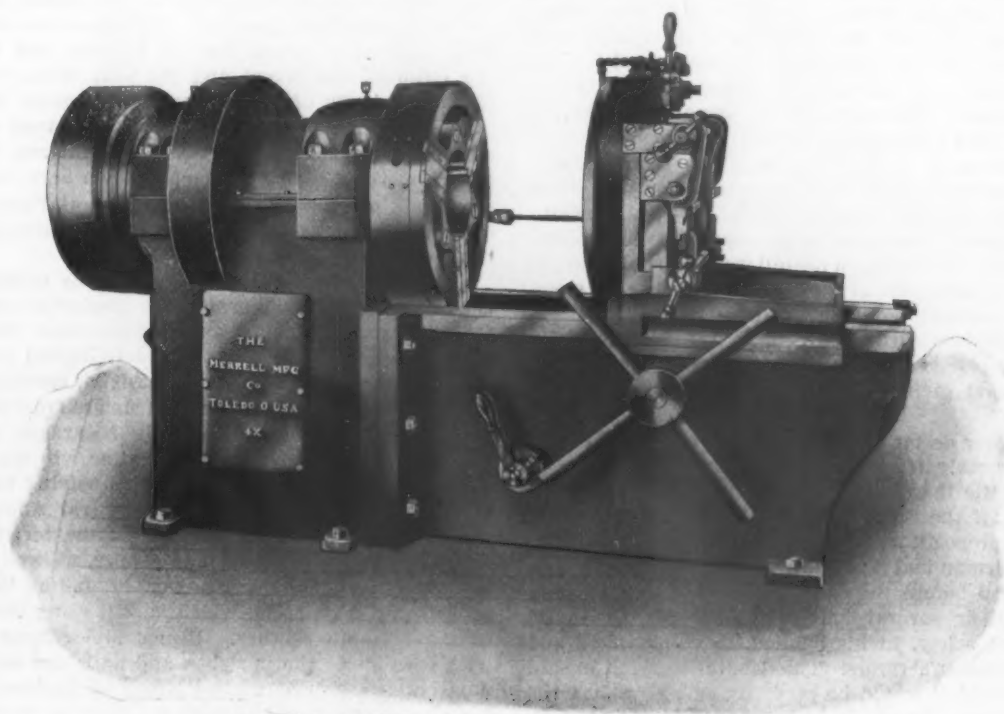
Design of the Apex line of machines for threading and cutting large sizes of pipe is intended to follow closely the commonly recognized modern machine tool practice. On each representative of this line of machines the head column and the apron bed supporting the die head ways are cast separately and are bolted rigidly together, as shown in the illustration. This construction allows both portions of the machine to be continuously supported upon the foundation.

Each machine is so geared as to obtain for each size of pipe within its range of capacity a separate and suitable speed. The gearing is entirely inclosed within the head column; it is thus out of the way of the operator and is protected from dust and chips. Each speed is entirely within the control of the operator, changes being made by simple movement of the lever in front of the apron below the ways. By this arrangement changes of speed may be made while the machine is in motion, so

drawing movement starts, as is commonly necessary in machines using the toggle joint locking device. The chasers are heavy and of unusual width, such as to give perfect taper for the full length of a standard thread.

The Apex machines are made by the Merrell Mfg. Company, Toledo, Ohio, by whom they have been built for more than two years in a quiet way. Recent additions to factory equipment have placed the company in a position to build them more extensively.

**The Association of Manufacturers of Light Steel Rails.**—On Thursday, January 14, a meeting of a number of mills rolling light steel rails was held in Pittsburgh for the purpose of adopting uniform prices, and to put the light rail market on a better basis. It was decided to organize a permanent organization, to be known as the Association of Manufacturers of Light Steel Rails, and the intention is, if possible, to work closely with the larger concerns like the Carnegie Steel Company, Cambria Steel Company, Jones & Laughlin Steel Company,



THE APEX PIPE THREADING AND CUTTING MACHINE.

that thread cutting may be done at one speed and the pipe cut off at another speed.

The chucks at both front and rear of the head stock are alike; projecting jaws are furnished so as to permit convenient holding of flanges. The chucks are powerful ones of the universal type, making it unnecessary to tighten each jaw separately; tightening of one jaw centers the pipe and grips it firmly.

The die head is massive throughout and the chasers are controlled by means of a hand lever attached to a pinion engaging the cam ring, which in turn engages the dies. Movement of this hand lever engages or withdraws the chasers from the pipe. In setting the dies it is necessary simply to loosen the lever from the cam ring pinion and rotate this pinion until the cam adjusts the dies to the size of pipe to be threaded; the nut on the hand lever is then tightened and the adjustment is permanently secured. The die head is fitted upon transverse ways, along which it may be slid to the rear, entirely out of the way of the cutting off knives, so that the latter may work close to the head stock chuck. There are two cutting off knives, these working diametrically opposite each other, and said thus to save more than one-half the time required in cutting off pipe where a single cutter is used. It is claimed that the use of the geared cam ring and the pinion for rotating it are entirely new and allow opening of the dies from threading position without first forcing the dies slightly into the threads before the with-

and others who roll light steel rails, but who were not represented at this meeting. For some time prices of light rails have been much below \$28, the price of standard sections. It was decided at the meeting to put the price of 12-pound rails at \$28 and 16 to 40 pound at \$27. The new organization includes a number of mills which make new light rails and also reroll old rails. Among the concerns represented and who have joined the association are the Union Rail Company, Huntington, W. Va.; Cambridge Rolling Mill Company, Cambridge, Ohio; Maryland Rail Company, Cumberland, Md.; Schoenthal Iron & Steel Company, Cumberland, Md.; Clearfield Iron & Steel Company, Clearfield, Pa.; Fairmont Steel Company, Fairmont, W. Va., and the Buffalo Steel Company, Buffalo, N. Y. The light rails made by these concerns are used mainly in mines, lumber camps and other places where tramways are necessary.

It is probable that within a short time the interests of the Lorain Steel Company will be merged into the National Tube Company, with headquarters in the Frick Building, Pittsburgh. It is understood that plans have been under way for some time looking to the merging of the interests of these two concerns.

The Ohio Valley Gas Company and the Wheeling Natural Gas Company of Pittsburgh have declared the quarterly dividends of 2½ per cent., payable January 20.

### The National Eight-Hour Bill.

WASHINGTON, D. C., January 19, 1904.—The House Committee on Labor has decided to begin hearings on the National Eight-Hour bill on Thursday, February 4, and to continue one day each week, closing on February 25. The original intention of the committee was to take up the subject during the present month, but many manufacturers who gave notice of their desire to appear against the bill have notified the committee that it would be impossible to come to Washington in January, owing to the special demands upon their time incident to the closing up of the year's business, the taking of inventories, &c. There is little prospect that the four days which the committee has set apart for hearings on this bill will furnish sufficient time to hear any considerable number of the opponents of the measure, and it is likely that the hearings will continue throughout the greater part of March.

Because of the slight prospect of bringing the bill out of the House committee at an early date, the officials of the American Federation of Labor recently took the matter up with Senator McComas, chairman of the Senate Committee on Education and Labor, who is the author or editor of the amended bill which was reported by the Senate committee in the last Congress, and which has been introduced in the House in the same form. At the request of the Federation officials Senator McComas called the bill up at the last meeting of his committee and urged a favorable report without waiting for the action of the House, on the ground that the identical measure had been reported from the Senate committee in the previous Congress. Action upon the bill was deferred owing to the absence of a quorum of the committee, only four members being present; nevertheless there was a sharp exchange of opinions with regard to the bill, and especially as to the propriety of attempting to force it through the Senate without giving the House ample opportunity to act upon it.

One Senator declared his willingness to vote to report the bill favorably if the chairman would consent to so amend the title that it should read, "A Measure for the Destruction of the Shipbuilding Industry." In explanation of this proposition, he said that throughout the hearings the chairman had repeatedly stated to manufacturers who appeared before the committee that the bill would not affect their several industries, and that it would apply almost solely, in his opinion, to shipbuilders and armor plate manufacturers. The Senator referred to said that he thought it would be perfectly safe to report the bill with such a title, which would frankly state its character, leaving it to the Senate as to whether action should be taken upon such a measure.

It is a well-known fact that during the hearings before the Senate committee in the last Congress Chairman McComas adopted the tactics of minimizing the effect of the opposition of scores of manufacturers who appeared against the bill by assuring them that, as it was possible under certain conditions to buy their products in the open market, the bill would not apply to their lines of industry. A number of witnesses reminded the chairman that his opinion, volunteered as to the scope of the measure, would afford them no protection in the event that the departments or the courts should construe the bill as applying to their products, and they therefore persisted in their opposition.

The Senate committee, after the session held on the 13th inst. adjourned for two weeks, and will convene next on the 27th inst., when it is understood Chairman McComas will make another attempt to secure action on the bill, or to begin hearings thereon. There are already on file with the committee applications from 50 prominent manufacturers representing not only the leading shipyards and iron and steel makers of the country, but all the principal lines of industry, and it is believed that a majority of the committee will insist upon an unrestricted opportunity for all to be heard who desire to appear.

Aside from the merits or demerits of the bill, there is a very strong feeling among the leaders of both Houses that this is an exceedingly inopportune time for the consideration of such a measure. It is recognized that wages

are being reduced in all industries, and that further cuts are probable in the near future. The adoption of a compulsory eight-hour day on a falling market would be an anomaly that would be regarded as absurd and illogical anywhere outside of Congressional circles. The wisest men in both Houses recognize the folly of attempting to bring this bill forward at this time, but it remains to be seen whether they will be able to resist the peculiar influences that are being exerted to secure favorable action on this remarkable measure.

W. L. C.

### Central American Notes.

SAN JOSE, C. A., December 31, 1903.—The promise of a new era in Panama Canal affairs is bringing renewed activities to all Central America. As soon as preliminary work begins such cities as San José, Cartago, Tegucigalpa, Guatemala and a dozen others will have an influx of Americans, with consequent building operations, for these cities, though of good size, seldom are prepared for a large increase of population. The reason why these cities will especially prosper is that Americans and Europeans generally cannot live at Panama and Colon on the Isthmus, the fevers and the heat being intolerable for the majority of white people. Therefore, they must go to the high plateaus to live, and the nearest cities are those already mentioned. Naturally, interest in everything American is now wide open down here, and it will not be six months after work is begun at Panama when north and south railways will be in construction between these cities.

Nicaragua, although she has lost the canal through her territory, has been granting a number of concessions for railways, mills, mines and steamer lines. The American Company on the Cocos River is backed principally by Chicago capital and is now dredging certain parts of the river so as to run a line of steamers from the Atlantic to several important points in Nicaragua and Honduras. At the Segovia mines the line will tap the projected railway to the interior, thus solving one of the difficult engineering problems of Central America, that of crossing the Cordilleras. In all the territory mentioned there are rich gold and copper, as well as silver and lead mines, more or less worked, and an industrious agricultural population, which is still using the methods of the fifteenth century. Beams and rafters are tied with cowhide to the uprights, and nails are seldom seen anywhere. Often a crooked bough of quebracha serves for a plow, and bullocks take the place of horses. Still these people, I am convinced, would welcome modern tools and appliances, just as other sections of Central America have done, once transportation makes freights possible. It is only a few years ago that the distance from the port of San José to Guatemala was made in four days by *diligencia*; now an American railroad, built by Americans, lands the traveler in Guatemala City in seven hours, and he is taken to his hotel in a street car through neat thoroughfares lighted by electricity, and he finds practically all the conveniences of an American city. Our machinery is to be seen in everyday use, whether on the streets, the farms, coffee plantations, or in many of the mines. This is mentioned as a mere beginning, because the country at large is only commencing to use our methods.

The German company running the Ocos Railway and the pier at the Ocos port are planning to reconstruct both, the great earthquake of several months ago having done great damage in that region. The large steel girders and stanchions were twisted up into all shapes imaginable, and the pier is now useless.

C.

The business of F. X. Brunell of Worcester, Mass., manufacturer of boilers and heating apparatus, has been taken over by a new corporation, the F. X. Brunell Mfg. Company, and will be considerably increased, the purpose being to increase the present plant. It is a Massachusetts corporation, with authorized capital stock of \$50,000. The officers are: President, F. X. Brunell; treasurer, J. B. Lucier, and clerk, W. R. Keating.

### The Adriance New Style Drawing Press.

Employment of an adaptation of the Geneva stop motion for operating the blank holder is perhaps the principal feature of special interest in the new machine illustrated by the engravings. Throughout the design, however, there are involved numerous features of novelty in machines of this type, many of which will bear special description. The press is intended for general drawing work and is built in several sizes to accommodate the wide range of capacities required in this line of service.

As shown in Fig. 1, the power is received by the machine at tight and loose pulleys fitted to the fly wheel

certain nonessentials, such as the form of the top of the frame, &c. In Fig. 1 the frame is shown closed by connection directly above the top of the working parts, while in Fig. 2 this connection is made around the upper head, front and back. The newer arrangement gives greater freedom of access to the working parts and has, therefore, been regularly adopted.

The working parts of the press consist of two sections, the drawing die mechanism and the blank holding device. These operations are actuated by separate shafts, arranged one above the other, as plainly shown in the engravings. The movable drawing die M, Fig. 3, of the form suited to the work in hand, is attached to a plunger,

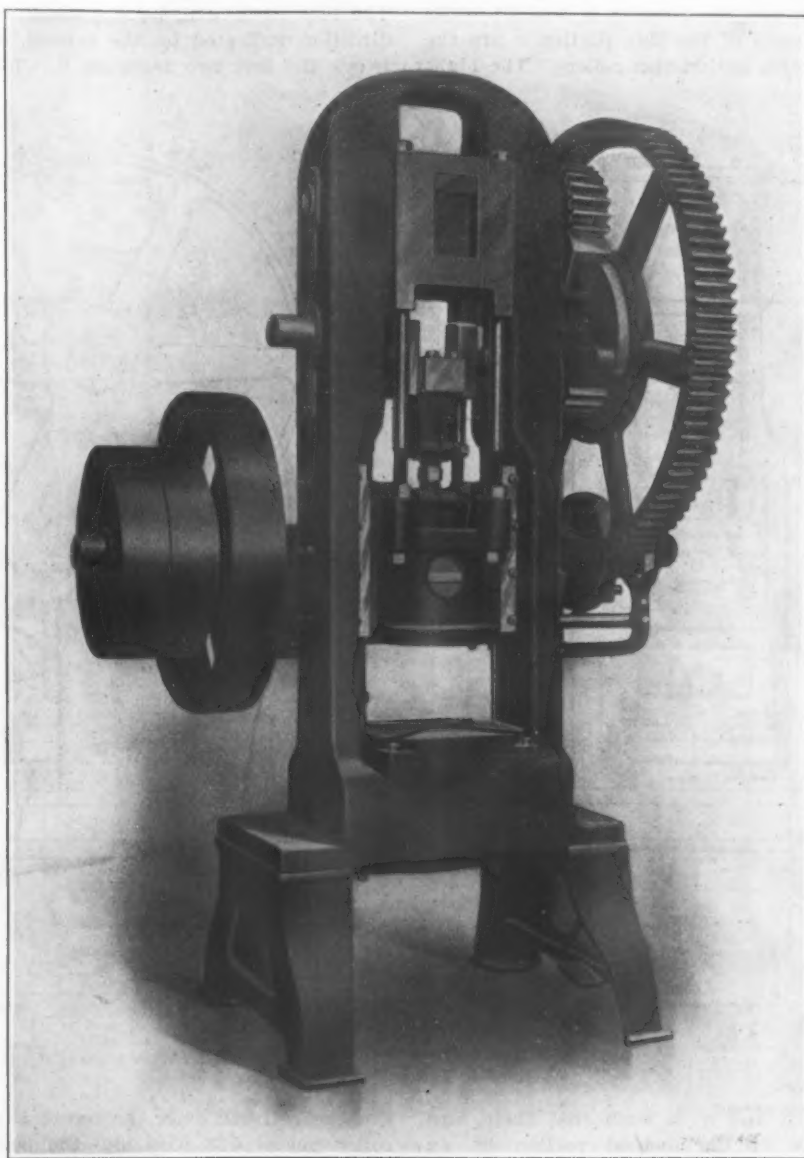


Fig. 1.—The Adriance New Style Drawing Press.

shaft, which shaft carries at its opposite end a friction clutch, to whose loose driven half is attached a pinion meshing with and driving the large gear upon the main crank shaft. This clutch is controlled by means of a treadle close to the right hand leg of the machine. The clutch is of the inclosed type, as made by the builders of the machine, and in its improved form presents no protruding points which may endanger the safety of persons passing or attending the machine. Slight pressure of the treadle for partial engagement of the clutch enables the operator to rotate the machine through any desired portion of the complete cycle, so that he may stop it at any point for changing of dies or for readjustment of any parts of its mechanism. The machine may, of course, be supplied without the friction clutch, and is so represented in Fig. 2, which illustration, however, represents an early design differing from the latest form of Fig. 1 in

J, working within the blank holder slide G. The plunger J is reciprocated vertically by means of connecting rod *j*, adjustable in length to suit the work in hand and deriving its motion from the crank *p* on the crank shaft C. The shaft C is rotated by the main gear *c*, Fig 2, whose motion is continuous when the machine is in operation. The blank holding mechanism is driven by the upper shaft D, whose crank reciprocates vertically the sliding head H, the action being upon the Scotch yoke principle. The block *o*, fitted to the crank pin *d*, slides horizontally forward and backward within the space *h* in the head H.

In order that the blank holder may have the necessary period of rest, clamping the blank before the drawing dies start into action and releasing it only just before the dies, having completed their operation, start to withdraw, the upper shaft D is driven from the main shaft C through a special form of Geneva stop motion, whose



action may be understood by examination of Figs. 3, 4 and 5, where it is shown in three characteristic positions, illustrating its action relative to that of the drawing dies. The main shaft C and the upper shaft D are fitted, between the main gear and the right hand frame of the machine, with mutilated gears, K and L, such that while the shaft C rotates continuously the shaft D is given an intermittent motion, its complete rotation being effected more quickly than that of the shaft C and the interval being made up by a period of rest representing the time during which the blank is clamped and the drawing dies are in actual operation.

The gear K is toothed for about half of its periphery, beyond which is formed a web about one-third as thick as the face width of the teeth. Immediately adjacent to the extreme teeth are the recesses *k* and *k'*, while attached to the extremes of the thin portion *r* are the pins *q* and *q'* fitted with antifriction rollers. The high

blank holder is down, the crank *d* being in its extreme lowest position, where it remains during its period of rest. The die M is about midway of its downward stroke, the crank *p* being in an approximately horizontal position. In Fig. 4 the die has descended and its work upon the blank is completed, while the blank holder has started on its upward motion and has relieved the work slightly before the die starts to rise. In Fig. 5 the blank holder has risen to its extreme height and has begun its next downward movement, the crank *d* having passed the upper center; the die M is still moving upward.

The action of the stop movement corresponding to these operations of the working parts may be understood from the diagrams above the sections in Figs. 3, 4 and 5. In Fig. 5 we find the toothed portions of K and L in mesh. The last tooth will, by continuing the rotation in the direction indicated by the arrows, enter the space between the last two teeth on K. Then the large tooth

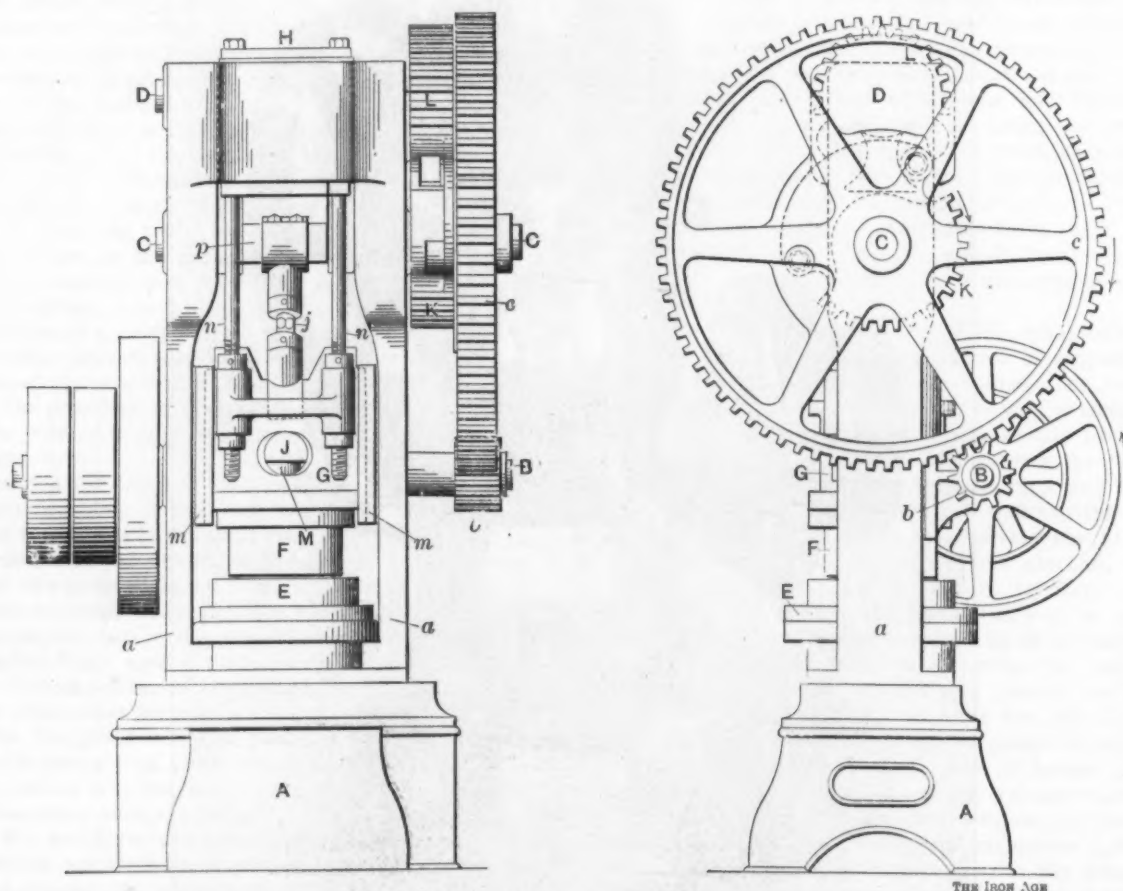


Fig. 2.—Front and Side Elevations of Adriance Press.

of these roller pins *q* and *q'* is such that their tops are below the plane of the toothed portion by an amount somewhat less than the thickness of the portion *r* to which they are attached. The periphery of the portion *r* is circular, concentric with the shaft C at a radius greater than the point radius of the teeth. The gear L is provided with one tooth less than the number on K, the pitch radius being of course less than that for K. Immediately beyond the toothed portion of L are two large teeth, *l* and *l'*, whose size and form are such that they will enter the recesses *k* and *k'* in the mating gear. Between the teeth *l* and *l'* are pockets or recesses *s* and *s'*, separated by the projection *t* and of a depth such that the roller pins *q* and *q'* may enter them. The portion *t* is thinner than the face width of the teeth by an amount such that it will not interfere with the portion *r* of gear K, but will allow the two to pass, as shown in Fig. 3.

Fig. 3, 4 and 5 represent vertical sections through the working parts of the machine, showing the mechanism at three characteristic points of the complete cycle. Above these sections are shown the gears K and L in their corresponding relative positions. In Fig. 3 the

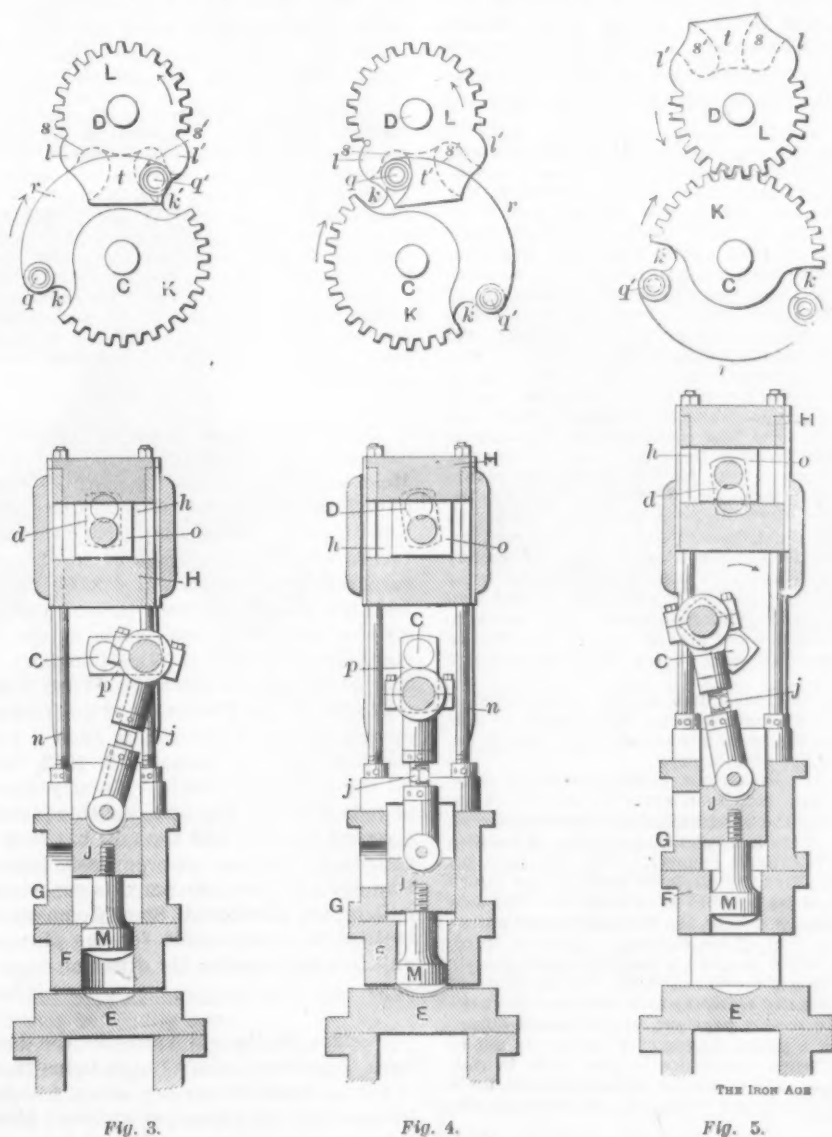
*l'* on gear L will enter the recess *k'* on gear K, and the roller pin *q'* will pass into the pocket *s'*. Continuing the motion from this point, the pin *q'* will drive the gear L by its rolling contact against the *s'* side of the tooth *l'*, bringing the two wheels into the position shown in Fig. 3. Here the pin *q'* has just ceased to drive the gear L and is ready to leave the pocket *s'*, having reached a position where its path is tangent to the form of the tooth *l'*. The roller pin *q'* is tangent to the arc of the periphery of the thin portion *r* and the forms and positions of the teeth *l* and *l'* with respect to the gear K are such that when the gears reach the position of Fig. 3 tooth *l* is in contact with the periphery *r*, and the pin *q'*, passing from the pocket *s'*, leaves also tooth *l'* in contact with *r*. Evidently, then, the gear L will be held motionless, while gear K may freely continue its rotation until pin *q* enters the pocket *s* and, striking the projection *t*, again starts L upon another turn. As the pin *q* enters this pocket, periphery *r* passes beyond tooth *l* and allows the latter to enter recess *k*, so that gear L is free to rotate. In Fig. 4 this rotation of gear L has already begun and its continuance will bring the first small tooth adjacent to the large tooth *l* into mesh

between the first two teeth on gear K as the roller pin  $q$  passes freely out of pocket  $s$ , having completed its driving work.

It should be noted that the pin  $q'$  enters the pocket  $s'$  and starts to drive the gear L by contact with the tooth  $l'$  before the blank holder comes into actual operation, and that upward movement of the blank holder is started by the pin  $q$ , this pin entering the pocket  $s$  and driving gear L by contact with the projection  $t$ . Thus the small teeth upon K and L bear none of the stresses due to actual clamping, holding or unclamping of the blank, all of this being done by the pins  $q$  and  $q'$ . The forms of the teeth  $l$  and  $l'$ , of the pockets  $s$  and  $s'$ , and of the projection  $t$ , as also the location of the pins  $q$

The main crank shaft of the machine is continued through the left hand upright, and is key seated, so that to it may be secured a cam or eccentric for operating such attachments.

The pressure exerted by the blank holder imposes stresses carried directly by the main frame and not, as is quite commonly the case, by the cams on the main shaft. The latter and more usual arrangement has been found to give more or less trouble due to springing and uneven wear. As has already been indicated, the blank holder mechanism is entirely disconnected from the motive power when the drawing operation is being performed, this absolute dwell of the blank holder being evidently conducive to good work and durability and



Sections of the Adriance Press, with Corresponding Positions of the Stop Motion Gears.

and  $q'$ , are such that the action of the stop motion is entirely smooth and without jar or noise, yet the locking of the blank holder gear L against rotation during the period of rest is entirely positive.

The blank holder proper is attached to the sliding head H by means of four adjustable rods. The platen is fitted with diagonal T-slots for clamping fixed dies into position. A hole of large size passes downward through the center of the bed. The general design is compact and is such as to avoid bending stresses upon any important parts, the working stresses being almost entirely either directly tensile or compressive. Such being the case, the utmost economy of size and weight has been possible. The left hand side of the machine is clear, so as to permit the attachment of any of the various feeding devices commonly used in connection with machines of this type in different classes of work.

to economy of motive power, since the clamping and drawing operations occur successively and not concurrently. As has also already been described, the actual work of cutting and clamping the blank is done entirely by antifriction rollers of ample strength, bearing against properly proportioned working surfaces, while the gear teeth connected with the stop motion act simply to carry the blank holder to and from the working position.

These presses are built by the Adriance Machine Works, 124 Imlay street, Brooklyn, N. Y., in sizes ranging in weight from 6000 to 150,000 pounds.

The American School Furniture Company moved their manufacturing and purchasing department on January 18 from 19-23 West Eighteenth street, New York, to 90 Wabash avenue, Chicago.

## A Workmen's Compensation Act in Massachusetts.

The commission appointed by the Governor of Massachusetts, under authority of the Legislature, to investigate the relations between employer and employee have made a report which is bound to create much discussion, especially among employers of labor, for it may mean the passage of a Workmen's Compensation act in Massachusetts, and that State has a way of inaugurating laws governing labor, which other States take up one after another until they become pretty general. This commission's *personnel* is one that will give unusual weight to their findings, the members being Carroll D. Wright, president of Clark College; Henry Sterling; Royal Robbins, president of the American Waltham Watch Company; William N. Osgood, and Davis R. Dewey of the Massachusetts Institute of Technology. These gentlemen are unanimous in their recommendation of the Workmen's Compensation act. Here is the section of their report relating to the subject:

Workmen's compensation acts, so called, have in different forms been enacted in several foreign countries, notably in Germany, Austria, Norway, Finland, Great Britain, Denmark, Holland, Sweden, Italy, France, Spain, New Zealand and South Australia. The best known of these acts is the British Workmen's Compensation Act of 1897, passed after long discussion. The object underlying all such acts is to remove in a measure, and so far as safety will warrant, the economic insecurity of employees, on the theory that, where a man receives injury while in the course of his employment, society should recoup him in some measure without resorting to charity; that a man working in any dangerous occupation, or in any occupation, as to that matter, is really doing a service to the public; he is enabling the public to prosper through industrial conditions, and therefore the public owes him something should he meet with disaster; that capital recoups itself for losses by charging off a certain percentage every year for deterioration of plant; that the working man has no means of charging off his deterioration of muscle and skill through the accidents incident to production, and that he ought, in all justice, to have such deterioration compensated in some reasonable way by society itself; that, as the deterioration of plant is paid for by being added to the cost of production, the deterioration of the man should also be added to the cost of production. The theory is, also—and this has determined the acts of foreign countries in this respect—that society ultimately pays all such cost through consumption.

The question before this committee is, how to establish a system, so far as accidents are concerned, which shall be fair to the employee suffering injury, and to the employer who in the first instance has to pay for such injury.

Under the proposed compensation act, the troublesome questions of assumption of risk, both in relation to defective ways, works and machinery, and the carelessness of fellow employees, are eliminated. In fine, there is no doubtful question of liability to be determined; that is entirely removed. The only questions arising under the act are, Has the employee sustained an injury in his employment, and, if so, to what is he entitled? The sum to which he is entitled depends upon the seriousness and nature of his injury and the amount of his earnings. If he is killed, his dependents, if any, would receive an amount approximately equal to his aggregate wages for three years. In the event of his total or partial incapacity to work, as a result of the accident, he would be paid a weekly payment, not to exceed 50 per cent. of his earnings, for a period during such incapacity not to exceed a term of four years. Provision is also made in case there are no dependents or next of kin for paying the reasonable expenses of the last sickness and burial of the deceased employee.

All questions of dispute between employers and employees arising under the act are settled by a committee equally representing both parties, or by an arbitrator appointed by agreement between them, or by a referee appointed by a justice of the Superior Court in cases of disagreement. There is no appeal in questions of fact, but questions of law may be reserved and passed upon by the Supreme Judicial Court.

It is pretty certain that employers of labor will not look with favor upon this plan—at any rate, not until they have learned more about the possible workings of such a law than comes to them at first thought. In England, however, it is said that employers are becoming more and more satisfied as time goes by. They are rid of litigation, which is expensive whether or not the verdict is against them because of fees paid to lawyers. They are rid of the endless claims brought for employees by pettifogging lawyers, who go about seeking clients among injured workmen. They are rid of the enormous damages which they not infrequently have to pay. But under the Compensation act they will always have to pay where an employee is injured, whether or not it be the fault of the employee. Such a liability is a very serious matter. As

for the workman, he would be the gainer all the way through, probably. In certain cases large damages are obtained for injuries received owing to employers' negligence, but the lawyers take a goodly slice of the amount of the verdict. In most instances the injured workman, or his family if he be killed, would receive more money than under the present system. The lawyers will doubtless disagree with the report of the commission, for many of them owe their professional existence to the proceeds of tort cases.

The weakness of the commission's report, however, lies in the fact that it leaves the present Employers' Liability act intact, giving to the workman the option of collecting damages under this or the Workmen's Compensation act. In other words, if the employee believes he can get more under the Employers' Liability act than under the new act, he could bring suit as at present. It is obvious that one or the other of the two laws should not exist. The commission agrees to this, but says:

While we are unanimously of opinion that the Employers' Liability Act and the Compensation Act should not permanently coexist as to the same establishments, we are divided on the question whether the Liability Act should continue in force temporarily as to such establishments as are covered by the Compensation Act until the latter shall have been tested by actual experience. We believe that in any event the injured employee should always have the option of recovery at common law in the event of gross negligence on the part of the employer.

The question as to whether the employee should, prior to an accident, make an election of the remedy to which he would resort, has been thoroughly considered, but no practical method of making such election has been suggested to or ascertained by the committee

**A World's Rod Record.**—To the Pittsburgh Steel Company of Pittsburgh, with rod and wire mills at Monessen, Pa., belongs the distinction of having made a record for rolling rods that will probably stand for some time to come. On the day turn on January 14 this plant turned out 716,500 pounds of No. 3 rods, and the night turn following turned out 613,000 pounds, or a total of 1,329,000 pounds for both turns. The best previous record for rod rolling was made at the Rankin Works of the American Steel & Wire Company, and amounted to 605,440 pounds on one turn. When it is known that the rod mill of the Pittsburgh Steel Company has been in operation only a little more than a year, having rolled the first rods on December 3, 1902, the above record is all the more remarkable. We may state that the output of rods made on the first day this plant was started was a record breaker, and the mill has been making splendid records right along. George Nash, formerly of the American Steel & Wire Company, is superintendent of the rod mill of the Pittsburgh Steel Company, and is certainly entitled to much credit for the phenomenal record the mill has made under his direction.

Strikes in the shipyards in the last twelve months have done much injury to the industry in New York and vicinity. Shipbuilders are afraid to take large contracts because they fear delay by strikes. Many contracts have gone to other cities, and it will take some months, it is said, before normal conditions are restored. The American Line decided last month, because of the many strikes, to have their repair work done in Southampton instead of in this country. The company spend an average of \$500,000 a year for repairs and other shipbuilding work. Government shipbuilding work is practically all that is being done here in the shipbuilding industry, with the exception of a little repair work.

Building operations in Omaha, Neb., are stated to be much more active than usual at this time of year, owing to the fact that the prolonged tie-up of last summer, due to the attitude of labor, led to the postponement of work that would otherwise have been completed then. The Omaha Business Men's Association took active charge of the labor war and defeated the unions, and building operations in that city are now conducted on the open shop basis, whereas a year ago it was impossible for a non-union workman to get employment.



### The Atlas Special Machine Vises.

Of the special vises shown in Figs. 1 and 2, the former is designed with particular reference to the needs of the tool maker, while the latter is intended for more regular work. The difference between the two vises, as is evident from the illustrations, is that while the vise in Fig. 2 is arranged to swivel only upon a vertical axis, the tool makers' vise, Fig. 1, is also pivoted upon a horizontal axis. Either vise may be used for holding work upon a planing, shaping, milling, drilling or grinding machine. The plain swivel vise, Fig. 2, while not possessing the universality of adjustment of the tool maker's vise, is, on account of the absence of the horizontal swivel, brought lower and closer to the bed of the machine, and is thereby enabled to hold the more rigidly any piece to be operated upon. Heavier cuts and more rapid feeds are, therefore, possible without chattering. The tool maker's vise, Fig. 1, may be quickly transformed into a plain vise by removing the base, to which it is attached by two tap bolts. This movable base swivels upon ground cones, and is arranged to allow rotation about the hori-

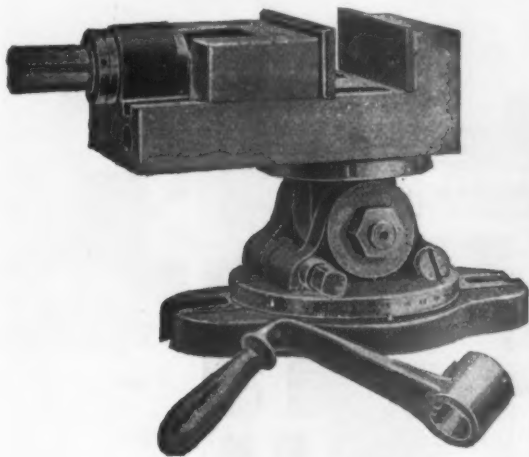


Fig. 1.—Tool Maker's Vise.

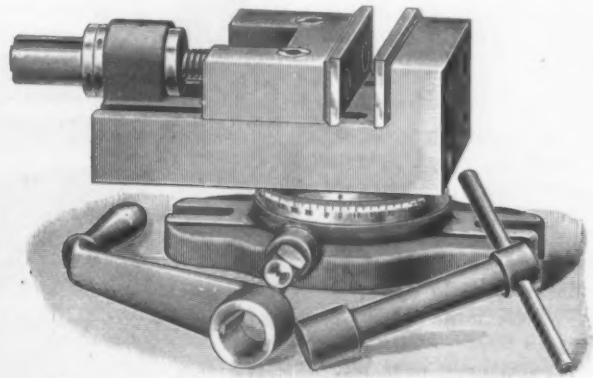


Fig. 2.—Plain Swivel Vise.

### THE ATLAS SPECIAL MACHINE VISES.

zontal axis through a total area of 55 degrees. The horizontal movement about the vertical axis is the same in both vises and is unlimited, the vise being arranged to travel through the complete circle. Both the horizontal and vertical swivelling movements are effected by means of square headed worms, engaging suitable worm wheels attached to their respective axes. Both swiveling movements are also provided with graduations such that the angularity of setting may be readily seen.

Of the vise proper, the removable jaw is made light so as to afford a maximum range of opening. The screw which operates the movable jaw does not of itself revolve; the handle attached to the extended shank merely rotates a long nut, through which the screw works. Both movable and fixed jaws are fitted with hardened and ground steel plates. The vises are made by the Atlas Machine Company, Providence, R. I.

**The Coal Miners' Demands.**—A convention of coal miners of the Pittsburgh district was held in that city last week, at which a general wage scale was adopted, and which will be submitted to the National Convention of Coal Miners, to be held shortly in Indianapolis. The scale, as adopted by the Pittsburgh miners, is as follows: "An advance of 10 cents a ton for pick mining, and a decrease of the differential between pick and machine mining and a proportionate advance for day labor. Coal companies to clean all harness and unharness mules. That next scale shall include wages for all outside day labor. That a scale rate be made to cover motormen and wiremen in the joint agreement. That the check off system shall be general for all employees in and about all mines. The advance in wages is demanded to cover the

base rate of screened coal over 1¼-inch screen, and at present this is 90 cents. The demand of the miners in the Pittsburgh district would bring this rate up to \$1 a ton, which, in the face of the depression in business, is not regarded favorably by the conservative element. It is believed, however, that if a settlement is reached by which the men will get last year's scale, it will be all that a majority of the miners expect and will meet with approval."

William H. Wood of Media, Penn., has just shipped one of his large hydraulic flanging presses. This press is 12 feet inside the columns, and is 9.5 feet wide. The central plunger which operates the platen is of 550 tons capacity, with an internal clamping plunger of 100 tons. The base of the press is fitted with four adjusting jack rams, worked through slots in the table for auxiliary clamping. The head of the press is fitted with a cylinder, the ram of which is 160 tons capacity. This press is one of a number made by Mr. Wood, and its total finished shipping weight was about 220,000 pounds. With the press was shipped one of the largest hydraulic riveting

machines ever built, being 18.5 feet in the gap, for a variable pressure up to 150 tons on the rivet. This riveter is fitted with a plate closer, which can be used on the very heavy work, or the riveting can be done without it. The transportation of these two machines alone required six of the large cars to carry them to Canada, where the machines are to be used for the new locomotive works. This is the second large order for Canada that Mr. Wood has filled recently.

An illustration of the concentration of modern plants is furnished by the new furnace plants of the Austrian Alpine Company, at Donawitz and Eisenerz, in Styria. The smelting of the bulk of the spathic ores raised in the Styrian Erzberg, which amounts to about 1,000,000 tons annually, has been concentrated in three large furnaces, each of a productive capacity of from 250 to 400 tons daily. Some of the coke is brought about 250 miles from Moravia, but the larger part from Westphalia, nearly 500 miles away; and as the works are situated in Alpine valleys approached by railways liable to be interrupted in winter, it has been necessary to provide storage for fuel on an unusually large scale at Eisenerz, where 16,000 tons of coke—about one month's consumption—can be stocked. A few years ago there were 44 charcoal blast furnaces in the district in question, but of these now only four are kept at work for the supply of special material for cast steel makers.

The Borough Council of Homestead, Pa., have given a contract to the United States Cast Iron Pipe & Foundry Company for 600 tons of 16-inch cast iron pipe at \$26 per gross ton.

### The Cincinnati Air Compressor Valve Gear.

In the central compressed air power plant at the St. Louis Exposition will be a large cross compound two-stage machine, having 13 and 24 inch steam cylinders, 22 and 14 inch air cylinders and a 24-inch stroke. This machine will run at 125 revolutions per minute, at which speed its capacity will be 1300 cubic feet of free air per minute. It will supply the general compressed air requirements of the exposition, while a second and smaller machine of a generally similar type will care for the needs of the transportation exhibits. The larger machine is of special interest as being the first compressor of its type publicly exhibited. The general construction of both machines is along the lines of standard practice by the makers, but on the larger machine the air valve gear is a distinguishing feature, combining as it does the positive action, noiseless operation and superior durability of the mechanically operated valve with the elasticity of the poppet valve. The noise and rapid wear of the

short distance, to the position represented by G in Fig. 4, the lower admission edge D of the valve comes into line with the lower edge of port B, Fig. 3, after which a slight further movement opens the inlet underneath valve A for free entrance of air to fill the cylinder behind the piston as the valve recedes. The valve continues to move in the direction of arrow C until the piston is about midstroke, when it reverses to the direction indicated by arrow E, so as to bring the valve back to the position of Fig. 3 at the end of the stroke, as indicated at H, Fig. 4. When, on the return stroke, the piston has traveled the short distance to J, Fig. 4, the valve, still moving in the direction of arrow E, reaches again the position shown in Fig. 2. Continuation of the movement of valve A then places the cylinder into communication with the space between valve A and poppet valve G, so that when the compression within the cylinder results in a pressure such as to lift the poppet valve, delivery of the air is made in the usual way, as represented by the portion K to F of Fig. 4.

Port B is thus positively closed during the whole of

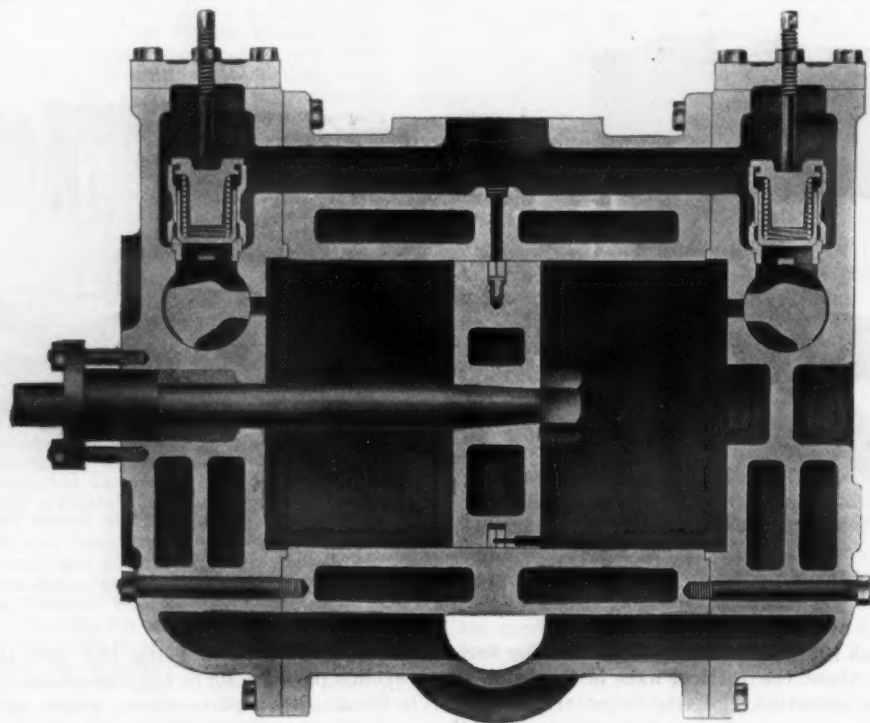


Fig. 1.—Section of Air Cylinder, with Cincinnati Valves.

#### THE CINCINNATI AIR COMPRESSOR VALVE GEAR.

poppet valve, due to the impact of closing at the reversal of stroke, is intended to be eliminated by mechanically closing the passages underneath the poppet valve, so as to leave a cushion of air upon which the latter may seat quietly and without injury.

In Fig. 1 is presented a longitudinal section through one air cylinder, showing the arrangement of the poppet valves in relation to the rotary valves beneath them. Figs. 2 and 3 show two characteristic positions of one rotary valve corresponding to piston positions which may be understood by reference to Fig. 4, as will be explained. Fig. 4 reproduces an indicator card taken from one of the air cylinders of a machine of this type, operated at 150 revolutions per minute and compressing air to 30 pounds pressure. Except for the wavy character of the delivery lines—K to F, for example, of the right hand diagram—the diagrams of Fig. 4 show very close approach to the practical ideal in air compression.

At the beginning of the forward stroke of the piston, as indicated by F, Fig. 4, the mechanical valve A, Fig. 2, is just closing the port B, the valve rotating in the direction of the arrow C and having reached a position such that the upper or discharge edge is line and line with the upper edge of the port. After the piston advances a

the inlet stroke of the piston, and the poppet valve G has the whole of the time represented by this stroke in which to quietly reach its seat. Closure of the port B by valve A at the end of the discharge stroke leaves between the valve A and the poppet G a volume of air under discharge pressure against which the poppet valve is gradually seated, easily and gently, during the inlet stroke, by the force exerted by the light helical spring shown in Figs. 2 and 3. Thus it may be seen that the opening of the inlet, the closing of the inlet and the closing of the discharge are all, therefore, positively and mechanically controlled. The opening of the discharge, which is the only variable point in the cycle, is controlled by the automatic poppet valves. These valves are relieved, however, of the necessity for quick closing, as already described. Referring to the action of the valve gear, as indicated by the diagrams of Fig. 4, attention is called to the steep expansion, F to G, which is pointed out as indicative of small clearance and high volumetric efficiency. In this card the inlet and atmospheric lines are practically coincident, and the discharge line, although wavy, is on the average quite horizontal, thus indicating ample valve and port areas.

This form of combination poppet and rotary valves is



designated as the Cincinnati gear by its makers, the Laidlaw-Dunn-Gordon Company, Cincinnati, Ohio.

**A Decision on Imported Muck Bar.**—In the United States Circuit Court, at Pittsburgh, last week, it was decided that an assessment of 0.6 cent a pound duty on imported muck bar is correct. Morehead, Brother & Co. of Pittsburgh imported a lot of muck bar last year, and the duty was assessed under paragraph 123 of the Tariff act of 1897, at six-tenths of 1 cent a pound. An appeal to the United States Board of Appraisers was set aside and the case was carried into court. The firm claimed that the duty should be assessed under paragraph 135 at 0.3 cent, or paragraph 124 at 0.5 cent. Judge Acheson decides that the collector was right in making the assessment at 0.6 cent under paragraph 123. Paragraph

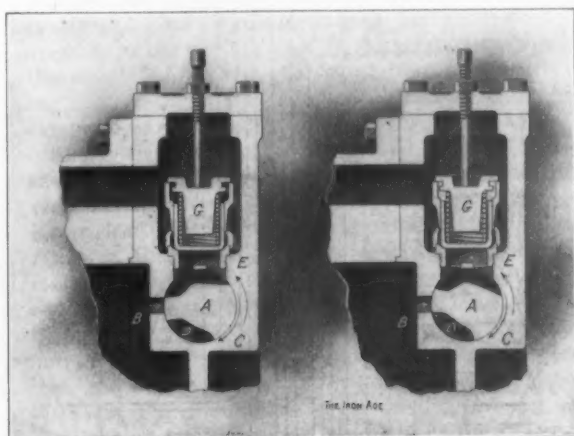


Fig. 2.

Fig. 3.

Critical Positions of Rotary Valve.

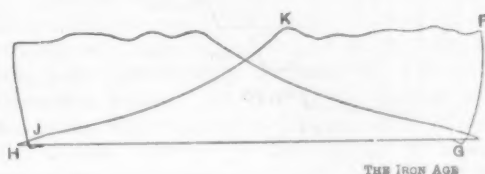


Fig. 4.—Air Cylinder Indicator Card.

#### THE CINCINNATI AIR COMPRESSOR VALVE GEAR.

135, he says, relates to steel only. He adds that the assessment of 0.6 cent was favorable to the importer, as it might have been at 0.8 cent on rolled iron.

Two of the remarkable alloys discovered by Dr. Guillaume in his study of high nickel and iron compounds are now made on a commercial scale. The first, to which the trade name "Invar" has been given, contains 37 per cent. of nickel, and after special heat treatment is practically unalterable in length between the ordinary ranges of atmospheric temperature, the dilatation per degree Fahrenheit being only 1-36 inch per mile. This is coming into use for standard bars, wires for base line measurements and other geodetic purposes, as well as for the pendulum rods of astronomical clocks and the compensation balances of chronometers. The alloy containing 46 per cent. of nickel, known as "Platinite," has the same coefficient of expansion as glass, and may therefore be substituted for platinum in the manufacture of incandescent electric lamps. It has also been used in Appert's armored glass, in which a wire network is inclosed between two plates of glass. A valuable memoir on the magnetic and other properties of these alloys has lately been published by Louis Dumas of the Comptoir Fourchambault Company.

#### Bids for the 13,000-Ton Battleships.

WASHINGTON, D. C., January 19, 1904.—The Secretary of the Navy, on the 15th inst., opened bids for the two 13,000-ton battleships, "Idaho" and "Mississippi," authorized by the last naval appropriation act. There was a large gathering of the representatives of shipyards and much interest attached to the proposals, owing to the novelty of the plans as prepared by the Board of Construction. The bids were as follows:

Wm. Cramp & Sons' Ship & Engine Building Company, Philadelphia, one vessel, to be completed in 39 months, \$3,200,000, or two vessels, one within 38 months and the other 40 months, at \$2,999,500 each.

Newport News Shipbuilding & Dry Dock Company, Newport News, Va., one vessel in 37 months, at \$3,147,000.

Maryland Steel Company, Baltimore, Md., one vessel within 42 months, \$3,472,000.

Fore River Shipbuilding Company, Quincy, Mass., one vessel, 42 months, \$3,468,000.

New York Shipbuilding Company, Camden, N. J., one vessel, 42 months, \$3,500,000.

It will be seen that while the Newport News Shipbuilding & Dry Dock Company submitted a lower bid than the Cramps for one vessel, yet the Cramps offered to build both ships at a more advantageous price than any other possible combination of proposals, and it has therefore been practically decided to award both ships to the Philadelphia yard.

#### Characteristics of the Vessels.

While planned on the general lines of first class battleships, the Board on Construction, in designing these vessels, was hampered by the tonnage limit and ordinance requirements of the appropriation act, and the type as embodied in the plans and specifications is conceded to be experimental. The general dimensions and features of these vessels are as follows: Length of load water line, 375 feet; breadth, extreme, at load water line, 77 feet; displacement on trial, not more than 13,000 tons; mean draft to the bottom of keel at trial displacement, 24 feet 8 inches; mean gross draft, full load, about 27 feet 1½ inches; total coal bunker capacity, about 1750 tons; coal carried on trial, 600 tons; feed water carried on trial, 40 tons.

To comply with the law, which requires these vessels to carry the heaviest armor of ships of their class, the plans provide that the hull shall be protected at the water line by a complete belt of armor 9 feet 3 inches wide and of a uniform thickness of 9 inches for about 244 feet amidships, forward and aft of which the belt is reduced in width and the thickness is reduced to 4 inches at the stem and stern. Triangular athwartship armor in wake of water line belt is 7 inches uniform thickness. The lower casemate armor extends to the limits of the magazine spaces and reaches from the top of the water line to the lower edge of the 7-inch gun ports on the main deck, and is 7 inches uniform thickness throughout, the athwartship armor bulkhead at the ends of this casemate being 7 inches thick. The casemate armor around the 7-inch guns on the main deck is 7 inches thick and the splinter bulkheads are 1½ inches thick. The protection of 3-inch guns is nickel steel 2 inches thick.

The armament "will include a main battery of four 12-inch, eight 8-inch and eight 7-inch breech-loading rifles, and two 18-inch submerged torpedo tubes, while the secondary battery will consist of twelve 3-inch 14-pounder rapid fire guns, six 3-pounder semi-automatic guns, two 1-pounder automatic guns 2 1-pounder rapid fire guns, two 3-inch field pieces, 2 machine guns caliber 0.30, and six automatic guns caliber 0.30. In the mounting of the main battery the Board has attempted to secure some novel effects. The 12-inch guns will be mounted in pairs in two electrically controlled, balanced, elliptical turrets, on the center line, one on the upper deck forward and one on the main deck aft, with an arc of fire of about 270 and 250 degrees, respectively. The 8-inch guns will be mounted in pairs in four electrically controlled, balanced, elliptical turrets, two on each beam, at each end of the superstructure. The 7-inch guns will be mounted in

pairs in four electrically controlled, balanced, elliptical turrets, two on each beam at each end of the superstructure. The 7-inch guns will be mounted in broadside, each pair of guns being isolated by transverse splinter bulkheads of nickel steel  $1\frac{1}{2}$  inches thick; forward and after guns arranged to fire right ahead and right astern, respectively; other 7-inch guns to have the usual broadside train. All the 7-inch guns are so arranged that their muzzles train inside the line of the side armor, thus leaving a clear and unobstructed side when it is desired to go alongside a pier or vessel.

The ships will be fitted with unusually well equipped machine shops containing lathes, shaping machines, drill presses, sensitive drills, milling machines, punches and shears, emery grinders, vises, &c.

W. L. G.

### A New System for Rolling Shapes.

A very interesting and highly promising new system for rolling shapes has been developed by Dr. Victor and Husham of Wiesbaden, who are represented in this country by M. Barschall, Bank of Commerce Building.

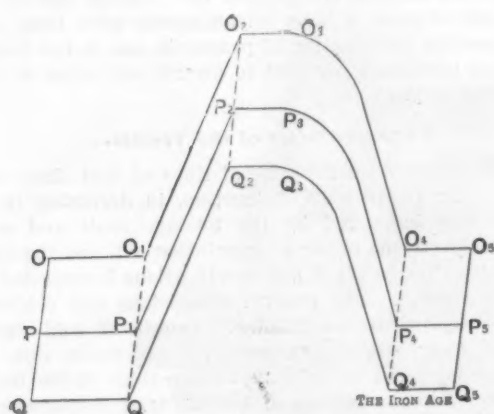


Fig. 1.

New York. The German inventors call these sections "Staple profile," a term somewhat difficult to cover by an equivalent English word. In substance it means that the sections are of such character that they may be piled one upon another, the characteristic feature being that the upper and the lower lines of the section are equal to one another. Fig. 1 illustrates the system. The dimensions and form of the upper and lower lines, O, O', O'', O''', O'''' and O''''', and P, P', P'', P''', P'''' and P''''', are

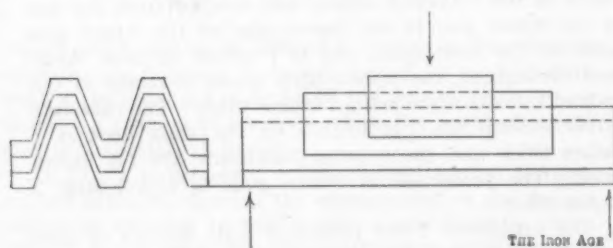


Fig. 2.

identical, and at every part of the section the thickness, parallel to the end lines O P, is the same, as shown in the dotted lines O' P', O'' P'' and O''' P'''.

This peculiar form of the rolled shape has many practical advantages. As in the case of flats, the area is computed simply by the product of the width measured on one of the lines and the thickness, the weight being arrived at in the usual way.

A very important point is that in rolling, the pressure is distributed over the whole section uniformly when the end lines are at right angles to the train line. For this reason the new shapes may be rolled to different thick-

nesses in the same finishing pass under uniform pressure. As the result of the latter, the roll design is very simple and it is possible to roll sections relatively wide and thin. In this manner the distribution of the material can be made in a very advantageous manner and cost may be materially reduced.

A matter of considerable practical importance in many instances is the ability to pile the sections upon one another and side by side, this being the result of the

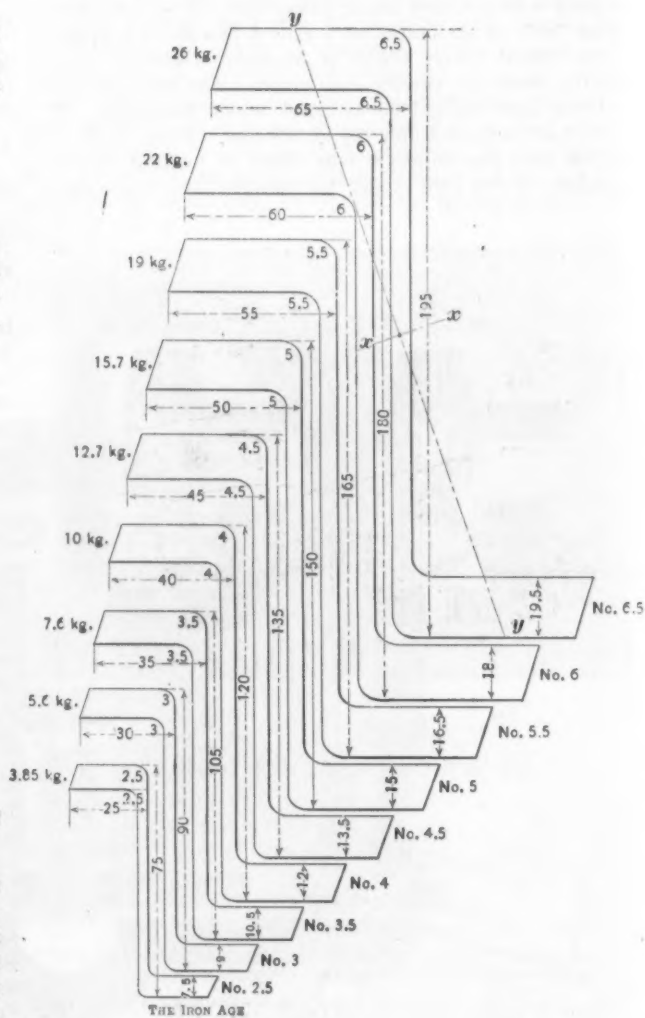


Fig. 3.

peculiar shape of the sections. They may be piled so that they cover one another with only slight interstices. Rolled bars may be put together so that they possess correspondingly increased capacity to carry loads. An illustration of this is furnished by Fig 2. They may be riveted or bolted together and thus be locally strengthened. Finally, this ability to pile them is an important consideration in transportation, notably in stowing in the holds of ships.

Fig. 3 shows an example of the new system as applied to a series of Z-bars, the inventors having developed an elaborate and comprehensive series which includes angles, corrugated shapes, shapes for tram roads, mono-rails, &c. In the example shown the thickness of the web and of the flanges is in the proportion of 1 to 3, the dimensions being in the millimeters. The center of gravity and the axes,  $xx$  and  $yy$ , are indicated in the case of the heaviest section shown.

The production of pig iron in the United Kingdom in the first half of 1903 has been ascertained by the British Iron Trade Association to have amounted to 4,378,998 tons, an increase of 282,520 tons over the corresponding period of 1902, and is at the rate of 8,757,996 tons for the twelve months. The production of open hearth steel in the first half of 1903 was 1,639,239 tons against 1,710,602 tons in the first half of 1902, a decrease of 71,363



tons. The output of Bessemer steel ingots in the first half of 1903 amounted to 911,670 tons, which compares with 888,378 tons in the corresponding six months of 1902.

### The Westphalian Coal Syndicate.

*The Iron and Coal Trades Review* prints the following:

Last week the German combination of colliery owners known as the Rhenish-Westphalian Coal Syndicate was renewed for another 12 years, the term of the new agreement being December 31, 1915. A controllable production of 77,840,000 tons of coal per annum! This is the output with which the syndicate has entered upon its new lease of life. With the exception of the exclusion of the insignificant colliery known as the Frele Vogel, the syndicate has been victorious all along the line. It need hardly be stated that this result has not been obtained without the most strenuous efforts on the part of the president, Emil Kirdorf, and of his coadjutors. The question of the participation in the production constituted the stumbling block in the negotiations with the dissenting collieries. On the adherence of these collieries the existence of the syndicate depended, for the constituent collieries had all stipulated for the ultimate adhesion of the outside coal mines. One after the other the chief representatives of these, such as the Deutscher Kaiser, Krupp, the Bochumer Company, Hörde, Union, Phoenix, Minister Achenbach, &c., gave way, and joined the association. The firm of Hanlel, who own the Rheinpreussen, Neumühl and Zollverein Collieries, demanded a participation of 9,000,000, but finally accepted 6,500,000 (the output in 1902 was 3,500,000). Other disputes were settled, and finally the Corcordia Company obtained, by arbitration, the grant of an extra 240,000 tons per annum for their new colliery. As late as the 12th of December, however, the Gutehoffnungshütte, the George-Marien, and the Mansfeld Iron Works still held out. On that date an arrangement was reached with the last two. The Gutehoffnungshütte, however, which produced in the year 1902 1,600,000 tons of coal, demanded a participation of 2,300,000 tons, while the syndicate offered the company 1,900,000 tons. The representatives of other works owning coal mines protested, and among them Herr Thyssen, who had recently affiliated his own colliery, the Deutscher Kaiser. At last public opinion was moved; the press, with unanimity, blamed severely the action of the owners. Ultimately the company gave way and accepted the participation of 1,900,000 tons offered by the syndicate, which was thus completed. It may be interesting, in view of the important position of the new members, whose adhesion has raised the syndicated possible outturn from 64,000,000 tons to nearly 78,000,000 tons, to give the following list of the new accessions with their allotted output in metric tons:

	Tons.		Tons.
Union .....	600,000	Neumühl .....	1,650,000
Rheinpreussen .....	3,000,000	Gutehoffnungshütte ..	1,900,000
Langenbrahm .....	360,000	Schnabel .....	300,000
Minister Achenbach ..	600,000	F. Krupp .....	700,000
Bochum Union .....	1,027,000	Phoenix .....	300,000
Hörde Verein .....	150,000	Deutscher Kaiser ..	1,650,000
Berneck .....	160,000	Werne .....	600,000
Mansfeld .....	600,000		

Most of the collieries enumerated above are owned by iron and steel works, and in these cases the allotted output does not include the quantity consumed in the works.

Negotiations were entered into with the collieries of the Aix-la-Chapelle district, but were broken off owing to nonagreement over the question of participation. From January 1, 1904, the syndicate will undertake the sale of coke and of briquettes, since the two associations formerly controlling the trade are now merged in it. The sale of coke will, as heretofore, be effected at Bochum. The name of "Coke Syndicate" is done away with, and the agency is known as the Rhenish-Westphalian syndicate for Bochum coal. The sale of briquettes will remain at Dortmund, under the management of the old functionaries of the defunct briquette syndicate.

### The Pilling Air Engine and Hoist.

It is a recognized fact that in a large share of the machinery constructed for driving by compressed air economy in air consumption is not accorded the degree of attention which it is safe to say is given to the design and operation of steam driven machinery, even of the smaller types. Purchasers and users of steam machinery have long since been educated to the matter of economy, and new equipment installed by them must fulfill reasonable requirements along this line, consistently with the size, type and importance of the apparatus itself. That a volume of compressed air whose presence in the receiver represents the expenditure of a dollar in steam power is itself worth a dollar, and is worthy of correspondingly careful and economical use should be recog-

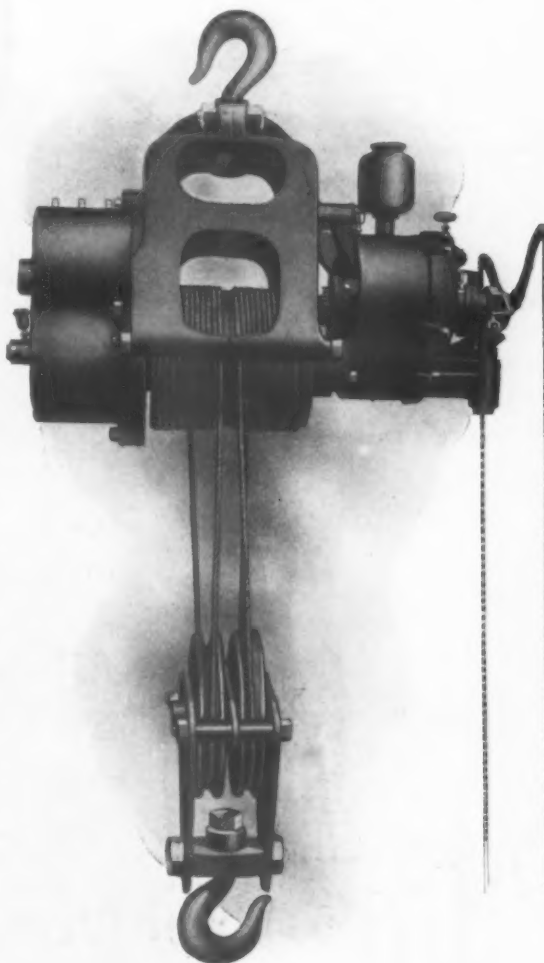


Fig. 1.—Air Hoist Complete.

#### THE PILLING AIR ENGINE AND HOIST.

nized, and we believe is coming to be more and more so recognized. Various types of air motors for a long time on the market have been mechanically quite efficient, but decidedly wasteful of air; more recent developments by various designers have shown intelligent and careful study of the point of economy in operation, and these designers are setting a pace which others will presumably soon be required to follow.

We illustrate at this time an air engine built essentially along the lines of the familiar oscillating steam engine, whose economy of steam, while not equal to that of more elaborate machinery, is yet in advance of that shown by the more common types of air using appliances. The Pilling air engine is adaptable to a large variety of general uses. In Fig 1 it is shown forming an essential part of a hoist to be hung from a stationary support or from a movable one, such as a crane jib or a traveling trolley or crane bridge. For more general use the engine may be geared to drive the mechanism of jib cranes of the

ordinary type, to actuate various sorts of hoisting and hauling devices, to rack trolleys carrying hoists, and to supply power for numerous other general and special purposes. As already indicated, the engine is of the oscillating type, and consists essentially of two cylinders placed 90 degrees from each other, their pistons attached to rods connecting them with a single crank pin. In Fig. 2 is shown a section through one cylinder, illustrating the construction of this feature and its appurtenances. The piston is conical in form, this shape allowing the use of a very deep stuffing box without material

ments each, with two springs under each segment. The stuffing box packing is metallic.

Fig. 5 shows the engine case opened, revealing the

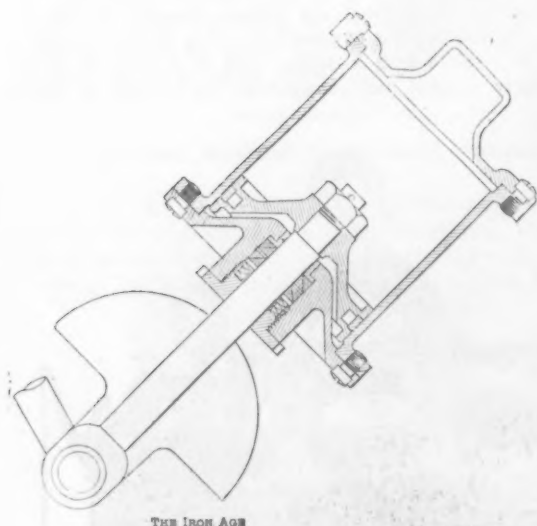


Fig. 2.—Section through One Cylinder of Engine, Showing Conical Piston.

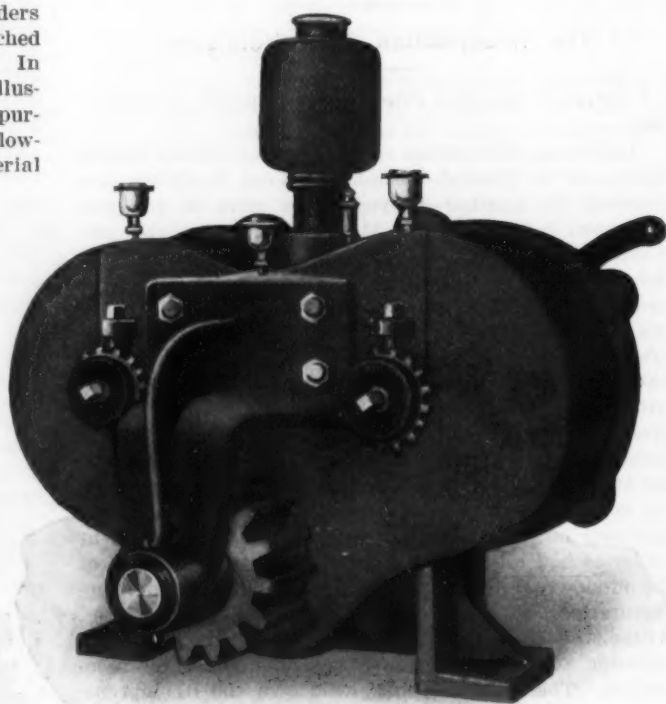


Fig. 3.—Rear View of Engine, Showing Driving Pinion and Exterior Adjustment of Ports.

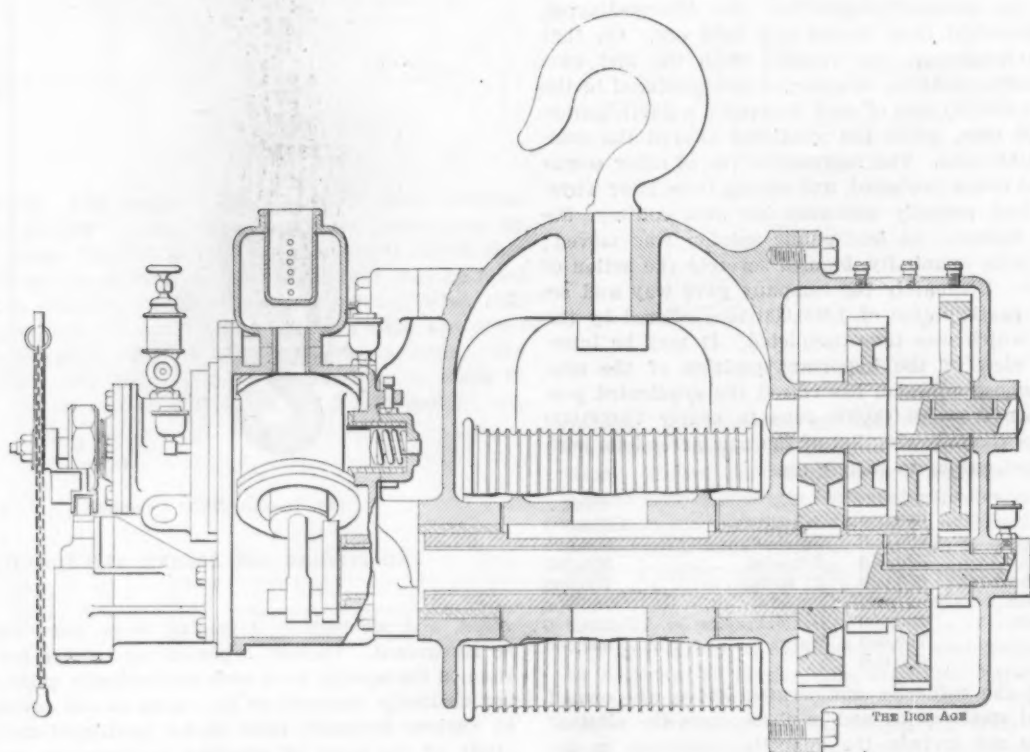


Fig. 4.—Elevation of Hoist, Partially in Section, Showing Drum Gearing.

#### THE PILLING AIR ENGINE AND HOIST.

increase of the distance between the cylinder and the crank. Compactness is thus maintained, while still permitting the long stuffing box bearing on the rod, so necessary in engines of the oscillating type. Interior form of the cylinder heads is kept in close conformity to that of the piston, so as to reduce clearance to a minimum. The piston packing rings are made in three seg-

cylinders, rods and cranks, and showing also the porting of the cylinder faces and of the corresponding disks on the cover plate. The operating lever, to the ends of which hand chains are shown attached in Fig. 1, is of the rotary type, similar to a Corliss valve. The valve admits air into one or the other of two chambers in the cover plate, according as one or the other hand chain is



pulled downward, the other chamber becoming for the time being the exhaust chest. The direction of movement of the engine is thus controlled directly by the hand chains. Exhaust air is allowed to escape into the engine case, its low temperature there serving to keep the parts cool and to chill the oil so that it will adhere to the rubbing surfaces. Port areas are large relatively to the size of the cylinders and the speed of the pistons. Careful balancing of the reciprocating parts is effected by counterweighing the crank disk after the manner shown in Figs. 2 and 5.

For general uses the crank shaft is extended through the rear of the case and fitted there with a pinion, beyond which is a rigid bracket bearing support, as in Fig. 3. This engraving also shows the external adjustment for

quill to the extreme right hand side of the gear housing, where it is fitted with a pinion meshing with a gear keyed to a sleeve turning loosely upon a short shaft, which itself rotates in bearings in the gear housing. The pinion also attached to this sleeve drives a gear fitted beside another pinion on a sleeve turning upon one end of the drum quill. This pinion in turn drives a gear keyed to the upper short shaft, whence the drum quill and the drum itself are driven through a fourth pinion and gear. Thus the drum speed is greatly reduced below that of the crank shaft by the quadruple gear train. The drum quill turns in bearings in the main housing, between which bearings the hubs of the drum are keyed to it. The crank shaft is supported in one bearing at the engine case and in another at the gear housing, passing

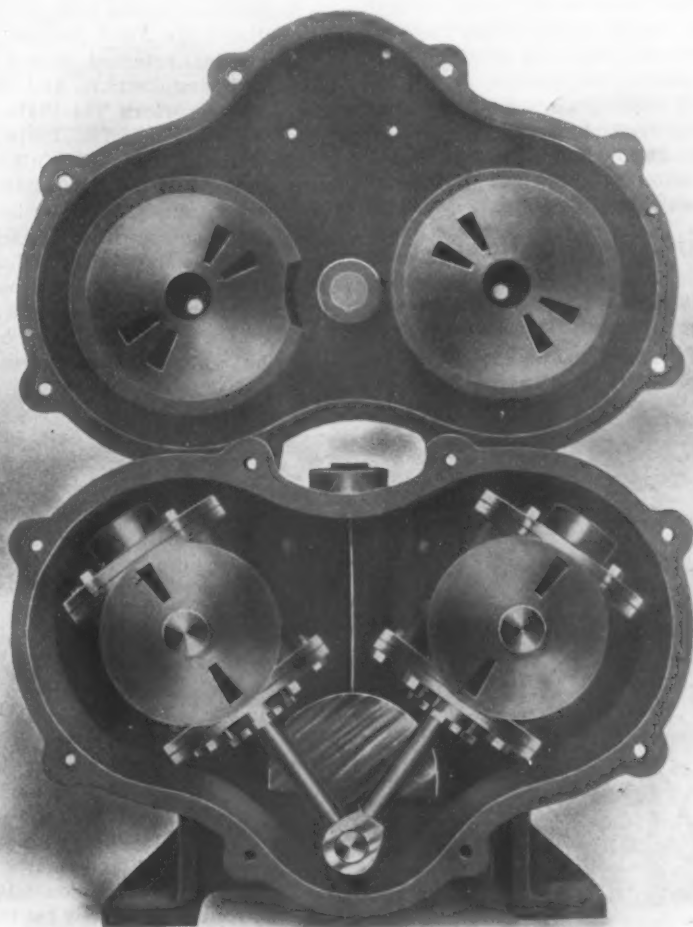


Fig. 5.—The Engine Opened, Showing Arrangement of Cylinders and Ports.

#### THE PILLING AIR ENGINE AND HOIST.

the pressure between the valve seat disks. The set screws pass through lugs cast upon the case and their points engage the teeth of adjusting nuts which control the compression of helical springs for maintaining the pressure of contact between the cylinder port disk and the admission and exhaust disk. The construction is evident from Fig. 4.

The use of the engine as motive power for the hoist of Fig. 1 is illustrated in detail by Fig. 4, which presents an elevation of the device, partially in section. Here the engine is at the left. Directly below the operating lever is a plunger which is pressed upward by a spring and tends to hold the lever in middle or closed position. The air supply pipe is attached at the hole below the oil cups at the left of the crank case. At top of the case is the exhaust head, whence the used air passes out from the case into which it flows from the cylinders, as already stated. The crank shaft passes through the cable drum

through the drum quill without touching it and without support from it.

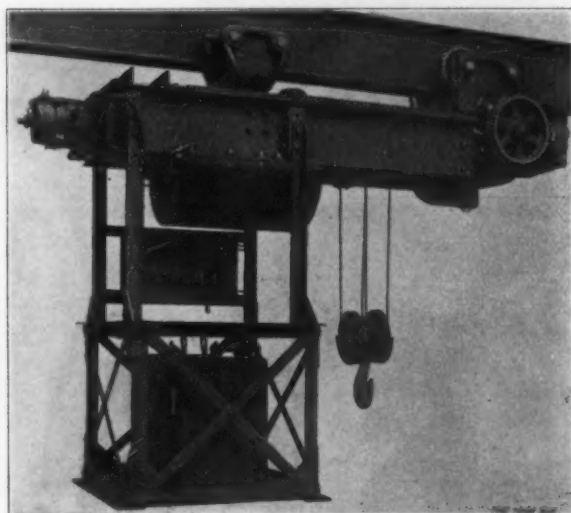
The hoisting drum is spirally grooved from each end toward the center. The machine is, therefore, balanced at all times, with or without load, and riding of the hoisting rope is practically impossible. The length and diameter of the drums are proportioned so as to allow the use of from 80 to 100 feet of rope, thus providing for from 18 to nearly 25 feet of clear lift. High speed is possible with these engines. These speeds, for 75 pounds per square inch working air pressure, are 700, 950 and 1200 revolutions per minute for the three sizes of engine, whose cylinder dimensions are, respectively,  $4\frac{1}{2} \times 4$  inches,  $3\frac{1}{2} \times 3\frac{1}{2}$  and  $3 \times 3$  inches. On account of this high speed, it is claimed that the consumption of air varies with the load, thus placing this machine in a position of superiority to others wherein the same quantity of air is used when the hook is hoisted empty or is low-

ered as when full load is being lifted. A triple increase of speed is claimed for these engines and hoists, a lifting speed of 21 feet per minute being accomplished as against 7 feet per minute, stated as being about the maximum attained by certain other hoists. While 21 feet per minute is approximately the hoisting speed, loads may be lifted as slowly as desired, and at any intermediate speed up to the maximum. With air pressures greater than 75 pounds higher speeds are, of course, possible. It is stated that the Pilling engine may be stalled by a load beyond its capacity, but that, owing to its mechanical excellence of construction, it cannot be thrown out of line, and that it cannot be broken, since it will not allow itself to be loaded beyond its ultimate capacity.

The gear case, engine box and cover are of cast iron; the main housing is of cast steel; all gears are cut from forged steel; the shafts are of steel; all bearings are bushed with bell metal. The valve seats are also of bell metal, and are removable. As is evident from the several illustrations, and especially from Fig. 4, careful attention has been given to efficient lubrication, and oiling devices are provided for all rubbing surfaces. The makers of the engine and of its various adaptations, as previously enumerated, are the Pilling Engine Works, Bucyrus, Ohio.

### The Niles Electric Traveling Hoist.

These hoists may be equipped with a cage, as shown in the engraving, or may be arranged for operation from the floor by means of pendent controllers. The hoisting



THE NILES ELECTRIC TRAVELING HOIST.

mechanism is placed between the channel framing of the trolley, and is geared directly to the drum. The machine is provided with a standard load and motor brake so as to make it in this respect equal to the most elaborate cranes. Movement of the trolley along the runway may be effected by electric motor driving or by hand racking; power for hoisting, however, is supplied in all cases by electric motor. Swivel trucks are furnished when the runway includes curved portions. The hoist is built in various styles, only one of which is illustrated, and in three sizes, of 3, 4 and 10 tons capacity, respectively. The Niles-Bement-Pond Company are the builders, the hoist being made at the crane department of the company in Philadelphia, Pa.

**The National Cellular Steel Company.**—The National Cellular Steel Company have been incorporated with a capital stock of \$300,000, for the manufacture of a product to be known as cellular steel. This is to be used in floors and walls of buildings, and is produced from sheet steel pressed into triangular cells, forming an upper and lower surface, with air chambers between. Recent tests

show that it is practically fire proof, and that it is exceedingly strong. The company are now considering the question of a plant, and will soon select a site in the vicinity of New York. It is their intention to erect a large plant in the spring so as to get their product on the market as early in the summer as possible. The officers are J. Van Vechten Olcott of New York, president; James M. Rude of Covington, Ky., vice-president, and J. J. Fleming of New York, secretary and treasurer, who with H. Neill Wilson of Pittsfield, Mass., and Sydney G. Stricker of Cincinnati form the Board of Directors. For the present communications should be addressed to the secretary, J. J. Fleming, 27 William street, New York.

### Interesting Tin Plate Developments.

A gentleman in the palm oil business is thus quoted by the *Philadelphia News Bureau*:

I have just returned from a tour of the principal tin plate producing districts, and was astonished at what I saw. The American Tin Plate Company, or rather the American Sheet & Tin Plate Company, are running nearly all of their mills full tilt, and have been for some time, while the independents are doing very little. The largest independent has been running half time at intervals, and meanwhile is closed altogether. They claim that while they are willing, and able, to cut the trust price and still make a profit they cannot get orders. I would say that the trust is making between 200,000 and 225,000 boxes of tin plate per week, having over 200 mills in operation, while the independents are only averaging between 25,000 and 35,000 boxes a week. The trust production, if continued for the whole year, would give them a production fully 50 per cent. in excess of the best year they ever had, yet December and January used to be considered the duldest months of the year in tin plate.

The question of why the trust can run when the independents cannot, although there is money in present prices, is because, while there is very little current demand, the trust is running on stock, of which it has already accumulated an enormous quantity. At the La Belle mill, in Wheeling, they have filled their warehouse chuck full and are now hauling the tin plate across the river to the Aetna Standard sheet mill warehouse. I should judge they have fully 200,000 boxes in the La Belle warehouse. At New Castle they have filled both their tin plate warehouses, and are sending tin plate over to the American Steel & Wire Company's warehouse. They have over 500,000 boxes stocked in New Castle already.

The tin plate workmen are quite contented, as they have plenty of work and their scale is signed to June 30 next. At the few nonunion mills there has been a big reduction, but the men look for that, and they are running full. In fact, they have been running their mill at Cleveland (nonunion) for three or four months when they didn't operate it during the great pressure of last summer, because nonunion wages then had not been reduced. But along about the time of the next annual convention of the workers, in May, you will see a lot of these mills closed down, just when according to precedent there ought to be increased activity, and the workers will get in a more tractable frame of mind. I did not see the continuous mill at Pittsburgh, but I hear that it is now a success and that they will proceed to install the process at a number of other plants. It may not be generally known, but I know it as a fact, that nearly a year ago the Steel Corporation made an appropriation of \$1,000,000 to extend this process, and now that it is a success this money will be spent. It will necessitate a number of mills being idle this spring and summer and when they resume they will still need some skilled men, whom they will want to hire at a half or a third the present rates per ton, on account of the reduced amount of labor involved. At the mills where it will not be installed until later they will want a big reduction also, and the only way to lead up to suitable terms is to give the men a lot of idleness this summer, which they are now preparing to do with their big stocks. As a result of the decreased labor cost, I look for us to be exporting large quantities of tin plate within a couple of years at the most.



## OBITUARY.

CHARLES F. ELMES.

Charles F. Elmes, president of the Chas. F. Elmes Engineering Works, Chicago, and one of the oldest and most prominent mechanical engineers of that city, died as a result of paralysis on January 10. Mr. Elmes designed the pumps and propelling machinery for the first Chicago fire boat, and also designed the first fire boat for the city of Milwaukee, both of them proving highly efficient. Mr. Elmes was born in Hallowell, Maine, December 1, 1845, removing to Wisconsin in 1858 and three years later to Chicago. Serving an apprenticeship in the machine shop conducted by his father, Carleton D. Elmes, he gained the thorough practical knowledge as a machinist, engineer and draftsman which contributed to his great success in the engineering field. His father and he then formed a copartnership under the name of Elmes & Son, which continued until the death of the elder Elmes in 1877. From 1877 to 1895 the business was conducted under the name of Charles F. Elmes. In the latter year



CHARLES F. ELMES.

the corporation was formed which has since been known as the Charles F. Elmes Engineering Works, his two sons, Carleton L. and Chas. W., who for several years had been in their father's employ, being admitted as stockholders of the new company. The business of the corporation has very materially increased with each succeeding year, and a wide territory is embraced in the distribution of their hydraulic presses, marine engines, linseed and corn oil mills and special machinery. The company's plant, which was designed and built by Charles F. Elmes, is of modern construction, provided with all equipment for rapid and economical handling of material. Mr. Elmes was a Knight Templar, a member of the American Society of Mechanical Engineers and of several clubs, a vice-president of St. Luke's Hospital and a vestryman of the Church of the Epiphany. He is survived by a widow, daughter and two sons.

## NOTES.

FRANK W. HOLLY, superintendent of the Holly Mfg. Company of Lockport, N. Y., and a noted water works engineer, died at Lockport January 16, aged 53 years, after a short illness. He was a son of the late Birdsill Holly, inventor of the Holly water works system.

CHRISTOPHER HOTZ of the firm of Schuttler & Hotz, Chicago's first wagon makers, died January 13, at his residence, as a result of a complication of ailments. Mr. Hotz was born in Wertheim-on-the-Main, in Baden, Germany, January 25, 1842, and graduated from an engineering college at Karlsruhe. At this school Mr. Hotz became acquainted with Peter Schuttler, whose sister he afterward married. One of his earliest positions was with Sulzer Brothers, at Winterthur, Switzerland, for which firm he invented many appliances, including the valve motion device for the Sulzer steam engine. Meantime his friend Schuttler had come to Chicago, and by him Mr. Hotz was persuaded in 1866 to come to this country. He first became associated with the firm of P. W. Gates & Co., and later, on the advice of Mr. Fraser of Fraser & Chalmers, engaged in business for himself, opening an office in the Yates Building, Randolph and Canal streets. This office he afterward turned over without consideration to Fred. Wolf, one of his draftsmen, who has since become so prominently known among manufacturers of ice machinery. In 1869 the firm of Schuttler & Hotz, wagon makers, started in Chicago. The firm grew rapidly until 1871, when their plant at Randolph and Franklin streets was destroyed in the great fire. A new factory was erected at Monroe and Clinton streets after the fire, where the company remained until May 11, 1903, when the new modern factory was completed at Twenty-second and Rockwell streets. This large plant gives employment to about 600 men, and has a capacity of about 20,000 wagons a year. Mr. Hotz was much interested in educational work, and was a trustee of the old Chicago University and a director of the Chicago Manual Training School, which is now affiliated with the University of Chicago. He was Civil Service Commissioner under Mayor Swift, a member of the Chicago, Commercial and Illinois clubs and of the Chicago Historical Society, a trustee of Lewis Institute and a director of the Illinois Trust & Savings Bank.

THOMAS J. FARRELL, manager of the London office of the American Steel & Wire Company, died on January 6 after a brief illness. Mr. Farrell was born in New Haven, Conn., in 1874. At a very early age he became connected with the wire business in which he subsequently became widely known. Prior to the formation of the American Steel & Wire Company Mr. Farrell was Eastern sales agent of the Pittsburgh Wire Company, and president of the Palatine Wire Company of Newburg, N. Y. Later he became manager of the London office of the American Steel & Wire Company, which position he relinquished in November last to take up important duties in the New York office of the United States Steel Products Export Company. Mr. Farrell was a brother of J. A. Farrell, president of the United States Steel Products Export Company, and W. H. Farrell, superintendent of the Donora works of the American Steel & Wire Company.

JACOB PHILLIPS MEDAY of New York died in Buffalo while visiting his son-in-law, Col. Francis G. Ward, Commissioner of Public Works. Mr. Meday was 75 years old, and was connected for many years with the firm of A. R. Whitney & Co. He was a veteran of the Mexican and Civil wars, serving in the navy in the former and in the Seventh Regiment throughout the latter.

JACOB HOUGHTON, one of the party who first discovered iron ore in Michigan, died at his home in Detroit, Mich., December 29, aged 76 years. Mr. Houghton was born in Fredonia, N. Y., and at the age of 15 came to Detroit to live with his brother, the late Dr. Douglas Houghton, first State Geologist for Michigan. He remained two years at Detroit, attending the branch of the State University in that city, and in 1844, at the age of 17, went on the Government survey of the mineral region of Lake Superior. From 1850 till 1852 he was on the Government survey of the Straits of Mackinac. In 1852 Mr. Houghton was appointed engineer and superintendent of the Detroit water works, during which term of office the first iron water pipes were laid, replacing those of tamarack logs. Resigning from this position in 1860, he became superintendent and general manager of the Bay State, Menard and Pontiac mines in the Lake Superior

region, and later, in 1875, took a similar position with the Michigamme mine. In 1878 he moved to Colorado and became manager of the Moose mine, afterward being elected president of the Synclinal Mining Company. Returning to Detroit in 1890. Mr. Houghton has spent several summers on Isle Royal, Lake Superior, exploring for copper. He held interests in the Isle Royal Land Corporation, Limited.

ETHAN R. CHENEY, well known in the iron trade in New England and as an inventor, died at his home in Brookline, Mass., Monday, the 11th inst., aged 74 years. He was a native of Barre, Mass. For a number of years he was with the Washburn & Moen Works at Worcester, Mass., until 1850, when he went to Boston. For 20 years he was master mechanic of the Norway Iron Works, and while with that company invented several machines. Several years ago he designed a giant lathe for the express purpose of turning the columns for the Cathedral of St. John the Divine, in New York City. These columns are 60 feet long and 6 feet in diameter. The lathe weighed 140 tons and attracted much attention in the mechanical world. During the later years of his life Mr. Cheney conducted a general contracting business.

HENRY GODDARD, one of the veterans of the Washburn & Moen Works, now the Worcester works of the American Steel & Wire Company, died at his home in Worcester, Tuesday, the 12th inst., at the age of 80 years. He was the son of Benjamin Goddard, an early partner of Ichabod Washburn, founder of the Washburn & Moen business. In 1844 he entered the employ of the firm as a wire drawer, and upon the death of his father succeeded him as manager of the South Worcester mill. He held this position until the mill was destroyed by fire in 1867, when he went to the Grove street works, and the next year returned to South Worcester to take charge of the new mill. In 1869 this mill was closed and he went to Grove street, where he remained as foreman of the wire drawing and nail department until October 3, 1898, when he resigned, having reached his seventy-fifth birthday. Mr. Goddard was always regarded at the Washburn & Moen works as one of the pillars of the industry.

WILLIAM HAMLIN HESTER, treasurer of the Pottstown Iron Company, Pottstown, Pa., died January 14 of paralysis, aged 47 years.

THOMAS CRAIG CARSON, manager of the sales department of the Carnegie Steel Company, died at his home in the East End, Pittsburgh, Sunday afternoon, January 17, of pneumonia, after an illness lasting one week. Mr. Carson was born in the Third Ward, Pittsburgh, March 11, 1851, and at quite an early age started as a salesman for a vehicle firm. After a few years he went into the offices of the Carnegie Steel Company, and was promoted from time to time until he became manager of the Western business of the company, with headquarters at Denver, Col. This position Mr. Carson held for seven years, and about seven years ago he was called back to Pittsburgh and made Pittsburgh sales agent of the company. It was Mr. Carson's principal duty to look after large contracts, and during the past few years of his life he had made trips to Japan, China, South America and South Africa. His time of service with the Carnegie Steel Company was about 18 years.

Should the selling price of bar iron fall below 1.30 cents, the wages of puddlers in Amalgamated mills will be reduced to \$5 a ton, which is the base of the scale. The scale provides that when bar iron is selling at 1 to 1.20 cents, inclusive, puddlers shall be paid \$5 per ton. For each advance of 10 cents per 100 pounds in the selling price of bar iron an advance of 25 cents shall be granted the puddlers. As sales of bar iron have been made on the basis of 1.25 cents, Youngstown, in the past month, it is believed that the wages of puddlers will be reduced to \$5 per ton for the months of March and April.

The announcement is made that a well known engineering firm of Kansas City has been commissioned to prepare plans for a mammoth bridge across the Strait of Canso, between Nova Scotia and Cape Breton Island. The bridge will be of cantilever type, and the main span

will be the longest in the world, a length of 1800 feet, 100 feet more than that of the Frith of Forth Bridge, which holds the present record. The bridge will be 150 feet above high water, so that the largest ships can go underneath with perfect safety, and will cross the strait between Hastings and Cape Porcupine. It is estimated that 35,000 tons of steel will be required.

A district convention of the International Tin Plate Workers' Protective Association will be held at New Castle, Pa., on February 6, at which delegates will be present from Sharon, Niles, Canton, Youngstown and other places.

In the United States District Court, at Pittsburgh, this week, final arguments were heard in the litigation of James W. Arrott against the Standard Sanitary Mfg. Company, the Court taking the papers. A decision will be made later.

## PERSONAL.

Henry C. Frick of Pittsburgh has been elected a director of the National City Bank of New York.

F. de P. Thomson, who was the mechanical engineer in charge of the design and construction of the new plant of the Lackawanna Steel Company, has opened an engineering office at 817 Fidelity Building, Buffalo.

C. E. Phelps, formerly with the Colorado Fuel & Iron Company, has been elected vice-president of the Whitebreast Fuel Company and of the Cardiff Coal Company, with office at 734 Rookery, Chicago.

C. D. Dyer, traffic manager of the Clairton Steel Company, Pittsburgh, has also been appointed traffic manager of the Crucible Steel Company of America, and will fill the duties of both offices.

E. S. Mills, assistant to Vice-President James Gayley of the United States Steel Corporation, has resigned. The office probably will be abolished.

J. R. Savage has succeeded Capt. R. H. Buckingham as general superintendent of the Lackawanna Iron & Steel Company's blast furnaces, ore banks, coke ovens and railroad interests at Lebanon, Pa.

W. E. Corey, president of the United States Steel Corporation, sailed on the steamship "La Savoie" for Havre on January 14. He will be abroad about six weeks. It was stated that he might combine business with pleasure.

John Fritz of Bethlehem, Pa., has recovered from his recent accident.

George W. Brown, formerly secretary of the Clairton Steel Company, has been promoted to general executive manager.

J. B. Clark, formerly superintendent of the Bessemer department of the Algoma Steel Company, at Sault Ste. Marie, Ont., has been appointed night superintendent of the Bessemer department of the Lackawanna Steel Company, at Buffalo, N. Y.

J. Edward Swanker, Albany, N. Y., manager and engineer of the Albany plant of the Empire Bridge Company, one of the constituents of the American Bridge Company, has accepted the position of general manager of the Teeside Bridge & Engineering Works, Limited, Middlesbrough, England, and will sail for England on February 1.

James H. Nutt, labor commissioner of the Republic Iron & Steel Company, Youngstown, Ohio, is lying seriously ill at his home from overwork. His condition is regarded as serious.

J. M. Boyd has been appointed general manager of the plant of the American Bridge Company, at Youngstown, Ohio, to succeed George Hunter, who has been appointed assistant general manager of the large plant of the American Bridge Company, at Ambridge, Pa.

J. Walter Rhodes, Pittsburgh, president of the Cherry Valley Iron Company, has gone to Hampton Terrace, Ga., for the winter.

The Climax Road Machine Company, Marathon, N. Y., builders of rock crushers, road machines, bridges, road rollers, engines, bins, &c., have opened an office in room 1019, Westinghouse Building, Pittsburgh, with C. H. Brinker in charge.



## Labor Notes.

The men employed at the Huntington works of the American Car & Foundry Company, at Huntington, W. Va., have gone out on a strike because of a reduction of 10 per cent. in wages.

The Youngstown Iron Sheet & Tube Company, Youngstown, Ohio, have posted notices of a reduction in wages averaging about 10 per cent. It applies on all labor except that governed by the Amalgamated scale.

Manager C. A. Collins, of the Buffalo Union Furnace Company, states there has been no reduction in furnace workers' wages in Buffalo or vicinity, and none is anticipated, notwithstanding the cut of 10 per cent. elsewhere. President James McMahon, of the Blast Furnace Workers' and Smelters' Union, was in Buffalo on the 7th inst. to attend a meeting of the executive committee to consider the subject of wages and held a private conference with the local representatives. There are about 1000 furnace workers in Buffalo and vicinity.

The members of the Electrical Workers' Union, at Buffalo, N. Y., are out on strike against the "open shop" policy adopted recently by the Electrical Contractors' Association of that city. While the labor leaders state that if the electrical contractors persist in their present attitude the men on all building jobs will be called out on sympathetic strike and all building trades tied up, the contractors assert they will not recede from their position in the "open shop" movement, being supported in their course by all members of the Builders' Exchange.

A cut in wages of from 10 to 25 per cent. has been made at the Chester, Pa., plant of the National Tube Company.

Twenty-two members of labor unions in Batavia, Ill., were arrested January 14, charged with riot, and their trial is now in progress. These men had made a demonstration before the factory of the United States Wind Mill & Pump Company 10 days ago, harassing and intimidating non-union men who were at work in the plant. It will be remembered that the Fox River Valley Manufacturers' Association had inaugurated a complete closing down of all manufacturing plants in that district in the hope that the labor unions would recede from their untenable demands, and the refusal on the part of the unions to make any concessions led to the employment of non-union labor, or, in other words, the open shop. The trial is being watched with interest, as the leading labor bodies of the Central West have sent their best legal counsel to Batavia to defend the men, and the Fox River Valley Association has employed prominent legal talent to prosecute. It is in the nature of a test case.

The 200 boiler makers in the shops of the Walsh & Weidener Company, Sherman Company and the Lookout Boiler Works, Chattanooga, Tenn., and the works at Battelle, Ala., which are in the Chattanooga territory, have struck for an eight-hour day.

The Taylor Iron & Steel Company, High Bridge, N. J., have made a reduction of 10 per cent. in the wages of the employees. About 300 men are affected.

Wire drawers at the plant of the Indiana Wire & Nail Company, Muncie, Ind., who went out on strike January 4 as a result of a reduction in wages of from 8 to 10 per cent., returned to work Wednesday, January 13. It is understood that the men return to work on the reduced wage scale.

The American Car & Foundry Company, St. Louis, Mo., have temporarily reduced wages about 10 per cent., as a result of the financial depression which has prevailed during the past few months, interrupting the heavy demand for cars which had previous to that time existed. This temporary suspension in car building has made competition exceptionally keen for the few contracts which are being let, and in order to bring down the cost of con-

struction in line with the reduced contract price of cars builders have forced wages lower for the time being. It is thought that when general business conditions again improve, former rates of pay will be reinstated.

The Austin Mfg. Company, Harvey, Ill., resumed operations in their plant on December 28 on the open shop basis, having been closed down since December 5 because of the demand on the part of the unions for a nine-hour day and no piece work. The company resumed work on the ten-hour basis, reserving the right of adopting piece work at any time they saw fit, and making special contracts with each workman individually on this basis. A strike was declared on January 9, but too few responded to cause trouble. The strike originated among the machinists and blacksmiths, and their local organizations in Harvey have been practically disrupted by their failure to win their point. It is understood that the Buda Foundry & Mfg. Company have had a similar experience.

Another walking delegate is on trial in New York on charges of extortion. He is Thomas C. Walsh, business agent of the Manhattan District Council, United Brotherhood of Carpenters. He is indicted for getting \$50 out of Henry Nicholsburg, a builder, of 263 West 112th street, under threat of a strike on a building.

The molders' strike ordered on May 24, 1902, against the Marietta Casting Company of Marietta, Pa., has been called off by the Molders' Union. The men went out on May 24, 1902. On August 11, 1902, the company started with nonunion men, and have been running successfully ever since.

The Massillon Iron & Steel Company, engineers, founders and machinists, Youngstown, Ohio, some time ago discharged all their union molders and core makers, and now deal with their men as individuals. They advise us their foundry is running full in all departments, and they have not had a single union man in their plant since November 28 last. The molders have declared a strike and are picketing the plant, but so far as the firm are concerned, they are causing no trouble. The concern also state they are getting a larger output with nonunion men than when union men were employed.

Spang, Chalfant & Co., Incorporated, Pittsburgh, operating the Aetna Iron & Tube Works, have notified their men of a material reduction in wages. Some of the men have refused to accept the cut, and threaten to go on strike unless the reductions are modified.

The Parkersburg Iron & Steel Company, Parkersburg, W. Va., have decided to operate their plant nonunion in the future. They will pay the same scale of wages as prevail in the nonunion mills of the American Sheet & Tin Plate Company.

At a conference between officials of the Amalgamated Association and the Republic Iron & Steel Company, held at Youngstown, Ohio, last week, an adjustment was made of a grievance which had been pending for some time at the Valley mill of the Republic Company. Until several weeks ago the men employed in turning out skelp iron on the bar mill were paid the bar mill scale. The company made a change by which the earnings of the men were materially reduced, and, though they continued working, they laid their grievances before the Amalgamated officials for settlement. Under the terms of the settlement, when 51 per cent. of the product of the mill is skelp iron the men are to be paid the skelp mill scale, with extras added for guide mill work.

The American Radiator Company expect to remove their general offices and Chicago branch, about May 1, to the new office building now under construction at 284 and 285 Michigan avenue. The building is to be four stories high, occupying a space 52 x 165 feet on the west side of the avenue, and about opposite the Logan monument. This building is being erected for the company, and will be occupied exclusively for their general offices and the salesroom of the Chicago branch.





been reduced, so that shrinkages in these items of cost in American shipyards will have to be very great to approximate costs abroad. If American ocean shipping interests can only see relief through cheap American built ships, they might as well give up the ghost at once.

### The Immigration Problem.

Three features of the immigration into the United States seem to demand attention—its size, its quality and its disposition to stay in the larger cities. Its immense volume causes apprehension among those who are ardent lovers of what we call our institutions, for the preservation of which in all their ancient purity it is necessary that the foreign additions to our population be assimilated and taught their duties as good citizens of a popular government as quickly as possible. Its poor quality excites the fears of those who are specially interested in the physical condition of the people and are anxious to guard against everything tending to spread disease, increase mortality or promote physical degeneracy. Its disposition to stay in the larger cities is deplored by those who see in the growth of overpopulated slums a distinct menace to every consideration of the public welfare. Immigration is now reaching higher figures than ever before attained in the history of the country. This is, of course, caused to a considerable extent by the extraordinary prosperity with which the United States has been favored for the past few years. Business depression, racial oppression and militarism in other countries have combined to cause large numbers of their people to seek a home elsewhere, and this country, with its opportunities for employment at high wages, has presented attractions which have turned much of the movement in this direction. Added to these influences have been the inducements offered by steamship companies anxious to increase the travel over their lines. Possibly to some extent the movement may have also been assisted by the efforts of American employers of labor to secure forces of workmen to relieve the recent great scarcity of labor.

This question of immigration is one which is regarded quite differently from various view points. Some would endeavor to bar all immigration, on the ground that our population is now sufficiently great to restrict this country to its natural increase without additions from abroad. Others who profess to be influenced by high humanitarian principles, which are above all considerations of a selfish character, would throw open the country to all races and conditions of men, claiming that natural laws should properly govern this whole matter. Neither of these, however, presents itself as a rational view. Of all countries in the world, the United States should not bar its doors to those having the qualifications for good citizenship. It would be selfish in the extreme to deny participation in our privileges to decent, healthy, self supporting men who are seeking to better their condition and that of their children. The fact must also be borne in mind that periodically the demand for labor in this country is so great that it is impossible to satisfy it from within our own borders. At such times additions to the ranks of our workingmen from abroad are exceedingly welcome. Indeed, if it were not for immigration, it would at times be impossible to carry on great improvements which have been undertaken. It therefore seems necessary that the stream of immigration should simply be regulated and not altogether checked. Another consideration which arises in this connection is the apparent necessity of adding to the skilled workmen of this country, owing to

the fact that the apprenticeship system has largely been broken down and our force of mechanics needs recruiting from abroad. This is a deplorable confession to make, but it is nevertheless compelled by the circumstances.

It is altogether probable that if our immigrants still came largely from Northern and Western Europe, as in the earlier days of the republic, their numbers would excite no serious apprehension. While a part of that immigration was undesirable, the overwhelming bulk of it was exceedingly satisfactory, being composed of sturdy farmers, mechanics and laborers, who did not hesitate to take their share of the work necessary to subdue the wilderness and develop the natural resources of the country. Now, however, our immigrants come largely from Southern and Eastern Europe and include hosts of persons whose physique is below American standards, while their home environments were such that they find congenial conditions in the most crowded tenements of the large cities. Officials of the United States Public Health and Marine Hospital Service state that the various filthy and infected, though perhaps picturesque, foreign quarters in the crowded centers of our population constitute to-day the greatest existing menace to the public health. At the same time, a population of this character contributes scantily toward the supply of workmen needed for the prosecution of enterprises requiring some physical exertion.

While the Government imposes wholesome restrictions on immigration, for the purpose of guarding against the admission of undesirable additions to our population, these restrictions are by no means adequate. The necessity exists for more stringent regulations whereby the standard may be raised much higher. These regulations should prescribe educational and physical as well as financial qualifications. An adult immigrant should at least be able to read and write in his own language, be able bodied so that he would not quickly become a public charge and should also have a sufficient sum of money to carry him away from the seaboard. A measure of this kind would be strongly supported by public sentiment.

### The Whitaker-Glessner Consolidation.

The organization of the Whitaker-Glessner Company, with a capital stock of \$2,000,000, has been completed, and the consolidation of various interests of the Whitaker Iron Company and the Wheeling Corrugating Company, Wheeling, W. Va., and the Laughlin Nail Company, Martin's Ferry, Ohio, has been consummated. The properties merged include the sheet mills of the Whitaker Iron Company and the sheet mills, nail works and shovel works of the Laughlin Nail Company. The new company also acquires from the Whitaker Iron Company a controlling interest in the Wheeling Corrugating Company, who, however, will operate independently, as heretofore, as will also the several departments of both the Whitaker and Laughlin companies, which are not included in the consolidation. The Portsmouth Steel Company, Portsmouth, Ohio, who are owned by the Whitaker Iron Company and the Laughlin Nail Company, have not been taken over, and will continue as an independent concern.

The company will be a strong one, controlling the product of 17 sheet mills with a yearly capacity of about 40,000 tons of iron and steel sheets, besides owning one of the largest nail and shovel works in the United States. A wide range of products will be covered, including those of the Wheeling Corrugating Company, manufacturers of tin and terne plates, roofings, metal ceilings, &c.

The officers are N. E. Whitaker, president; W. L. Glessner, vice-president, and A. C. Whitaker, secretary and treasurer.

## The Merchant Marine Commission Bill.

### House Committee Hears Arguments In Its Favor.

WASHINGTON, D. C., January 19, 1904.—The House Committee on the Merchant Marine and Fisheries, on the 14th inst., gave a hearing on the bill introduced by Representative Gardner, of Massachusetts, and indorsed by the President and the Secretary of Commerce and Labor, providing for a commission to investigate the advisability of federal legislation in aid of the American merchant marine and the extension of our foreign commerce. Among those who presented arguments were representatives of the leading shipbuilding and shipowning interests of the country, including Rear Admiral Bowles, retired, president of the Fore River Ship and Engine Company, Quincy, Mass.; Edwin S. Cramp, of the Cramp Ship and Engine Building Company, Philadelphia; C. B. Orcutt, president of the Newport News Shipbuilding and Dry Dock Company, Newport News, Va.; De Courcey May of the United States Shipbuilding Company, Camden, N. J.; O. S. Sewall, of the Sewall Shipbuilding Company, Bath, Me.; Alfred Windsor, president of the Boston Steamship Company, Boston, Mass.; A. R. Smith, of the New York Maritime Association; Winthrop L. Marvin, of the Boston Journal, and others. The arguments at this hearing were all in favor of the pending measure.

#### Purpose of the Bill.

Representative Gardner opened the hearing with a general statement concerning the purpose of the commission bill. He pointed to the fact that in the past hundred years the foreign commerce of the country has increased 1300 per cent., while the tonnage of American vessels in the foreign trade has increased but 50 per cent. A hundred years ago we carried 85 per cent. of our own trade, while to-day we are carrying less than 9 per cent., having practically abandoned to foreigners one of the most lucrative fields of human endeavor. The purpose of the commission would be to ascertain the cause at the bottom of this surprising condition of things and, if possible, to apply a remedy. In suggesting remedies, Mr. Gardner said six different propositions had been put forward, namely: 1. The repeal of our registry laws. 2. Discriminating duties on goods imported in foreign bottoms. 3. Discriminating tonnage taxes on foreign bottoms. 4. A system of export bounties. 5. A system of premiums on shipbuilding. 6. The payment of money subsidies for cargo carried or distance traveled by American ships. Objections have been urged to each of these methods, and it is therefore important that a commission of experts should take the matter up and examine it thoroughly with a view to deciding what features of these various programmes might profitably be combined into some general measure of legislation.

#### The Government's Unkept Pledge.

Mr. Marvin, in addressing the committee, said that the commission bill had been presented in order that Congress might take the first comprehensive step toward fulfilling the one unkept pledge of the Government of the United States. Congress had created a great system of coast defenses, had organized and strengthened the army and the national guard, had built a great navy, and had now embarked upon the task of digging an isthmian canal. Unless while digging the canal steps were taken to provide American ships to sail in it, the country, and the Southern States especially, would be keenly disappointed in the results to our commerce of that great waterway. Mr. Marvin reviewed briefly the agitation in Congress for the passage of a shipping bill in 1898, and said that the prospect for legislation at that time, together with the effect of the Spanish war, which withdrew many vessels from the merchant marine, caused a boom in the shipbuilding industry and many orders were placed in American yards. Nearly all of these vessels have since been finished; the others are now receiving their final touches. But since that boom there has come an absolute paralysis in the ocean carrying trade of the United States, and not since June, 1901, has the keel been laid in any American

shipyard on either coast of the United States for one steel steamship designed for foreign commerce. There was never a time in our history, not even during the Revolution, when ocean shipbuilding in the United States was in such a condition of absolutely arrested development.

#### Admiral Bowles' Views.

Admiral Bowles emphasized the necessity of appointing a commission without a day's delay. At the present time, he said there was absolutely no inquiry for any ocean going steamers or other vessels of the foreign trade. His own company's work was confined to building vessels for the naval service and for the coastwise trade, and there was very little to be done. Taking up the question of the make-up of the commission, he said that he doubted whether the Cabinet officers designated to serve thereon would be able to give the time necessary to the careful consideration which the subject deserved. In his 28 years of service in the navy he had acquired some intimate knowledge of how departmental affairs are conducted, and he therefore suggested the advisability of incorporating in the commission representative merchants and public men from the various sections of the country who would have no interest in whatever action might be taken further than a desire to aid the commerce and general welfare of the country.

#### A Shipowner's Experience.

Mr. Windsor gave some practical illustrations of present conditions in the shipbuilding industry. Several years ago when the subject of aiding the merchant marine was agitated in Congress, the Boston Steamship Company began to build a 5000-ton vessel, and another new company was started which built two vessels of 12-000 tons capacity each. The latter vessels were the largest tramp ships ever built in the United States. The original intention was to run them to England, but the expected Congressional aid did not come, and it was soon seen that there was no opportunity in running to British ports against the subsidized mail steamers. Then the company made up their minds that, as the United States had taken possession of the Philippine Islands, there was a chance to build up a line to Manila. The ships referred to were therefore placed on the Pacific Coast, and were run from Puget Sound and Seattle to Japan, Hongkong, Manila, Vladivostock and Port Arthur. But right along side of these vessels a line of British ships is running, that of the Canadian Pacific Steamship Company, subsidized to the amount of \$300,000 a year, while running directly into Seattle is a Japanese steamship line receiving \$800,000 per annum in subsidies in addition to a bounty of \$10 per ton for every ship that is built. There is not sufficient merchandise moving to and from the Philippines to begin to load the company's large ships, and a heavy annual loss is being made. Such a business cannot be carried on indefinitely, and the only end in sight is the hauling off those ships or placing them under a foreign flag. With regard to the relative cost of operating American and British ships, Mr. Windsor had made a very careful calculation based on the actual expenditure on account of one of his own vessels, the "Pleiades," and the British ship, "Lady Josie," of the same tonnage. His annual charge for wages was \$14,580, as against \$11,332 for the British vessel, and his provisions cost at least 30 per cent. more than those of the British ship. His company would never attempt to build another vessel under present conditions.

#### Prompt Action Necessary.

Mr. Orcutt urged that the shipbuilding industry was entitled to some consideration, but that if any aid should be provided by Congress it would have to come very soon to be of any value. The Newport News Shipbuilding & Dry Dock Company are now employing about 6500 men, and have brought to one of the States of this great republic a very helpful and hopeful enterprise. To-day, however, shipbuilders are confronted with the fact that there are far more yards in the country than the business warrants. There is scarcely a vessel in sight for contract, and this is because the people cannot make the vessels pay after having them built. The shipbuilding industry is languishing and cannot recover of its own



strength. Special favors are not sought, but the industry is one to be proud of and it ought to be kept alive instead of permitting it to die, for later on a wise policy will probably be adopted, and then, when orders for ships come, there will be no facilities for their construction.

#### Mr. Cramp's Statement.

Mr. Cramp said that the statements made to the committee did not present an overdrawn picture of the present condition of the shipbuilding industry. The condition of the United States in the event of a great European war, he said, would be pitiable, and in case we should become involved in the war it could not fail to be disastrous. We are building up a large navy, but it will be impossible to man it unless we have a merchant marine. During the Spanish war we bought over 50 ships from foreign countries, and paid fabulous prices for them. We should have been able to get twice as good ships for half the money. Taking up the subject of the relative cost of building ships in the United States and abroad, he said that the Senate Committee on Commerce several years ago had reached the conclusion that ships could be built in the United States for about 25 per cent. more than abroad; to-day, however, the difference in the cost of construction is greater than ever before in the history of this country. Some materials now cost 60 per cent. more in this country than in England. We pay \$40 a ton for certain materials going into ships which can be bought abroad, of even better quality, for \$25. In addition, owing to the great prosperity in this country, mechanics refuse to work for shipbuilders for \$2.50 a day when they can get \$4 a day on a steel building. Even apprentice boys get as much pay in certain branches of steel construction as journeymen formerly received in the shipbuilding business. The high wages paid for construction work have drawn workmen from shipyards, and even those that have remained have been able to secure an increase which can be put conservatively at 50 per cent. If these facts are true and the industry is really necessary for the welfare of the country, it is certainly no more than right that the country should give it some assistance.

#### A Unit on this Measure.

Mr. Smith of the Maritime Association of the Port of New York stated that that organization is composed of 1072 members and is the largest of its kind in the world. There is a foreign element in the membership amounting to 25 or 30 per cent., due to the large representation of foreign vessels in the United States, and while there is some division of opinion in the association as to methods of procedure, yet the members are unanimous in their desire for the adoption of the commission bill. Referring to the protection policy now in force, Mr. Smith said that American capital to-day could safely be invested in any conservatively managed protected industry, and consequently the people would not put their money into ships. Should Congress adopt such a measure as that proposed in the last Congress the shipbuilding and ship owning business would be placed on a par with the protected industries on land, and it would then be safe for American capitalists to put their money into American ships. Congress should get rid of the idea that the proposed subsidy would inure to the benefit of the men who constitute the ship owning class to-day. Almost all the ship owners now own foreign vessels, out of which they make quite as much as it would be possible to make out of ships under the American flag with any reasonable subsidy. Any American citizen can now go abroad and buy a vessel and run it in the foreign trade in the same manner as a foreigner, and earn just as much money as a foreigner can earn. Any reasonable assistance accorded the American merchant marine would simply mean that Americans would transfer their capital from foreign to American vessels.

#### Could Not Compete in Foreign Trade.

Mr. Sewall said that he represented a firm of shipbuilders and ship owners confined exclusively to the building and managing of sailing vessels. It was a family affair, and had been since 1823, and throughout that long period they had built sailing vessels almost entirely for the foreign trade. His firm had continued the building of

wooden tonnage up to 1894, and then changed over to steel tonnage, and since that time had built a number of vessels for the foreign trade. They had endeavored in every way to build vessels that would compete with foreign vessels, even buying imported materials when they could be had more cheaply. About the time they commenced to build steel tonnage they began to meet the fierce competition of French sailing ships, heavily subsidized. They did not mind it at first because there were very few of them afloat, but of recent years they had increased very rapidly, and at the present time they had practically driven the American ships out of the foreign trade. They stood it as long as they could; but, about a year ago, the firm finished their last ship, and since then they have built one vessel for the coastwise trade, but now the yard is shut down, with no prospect of opening until something is done by the Government. He hoped Congress would act promptly and decide whether America would have a mercantile marine or not.

#### A Languishing Industry.

The hearing closed with a brief statement by De Courcay May, who said there was no possible doubt that the shipping industry, and shipbuilding in particular, was in a languishing condition, and unless something was done for it American shipbuilders would have to close their yards. His own company were fortunate in securing a large contract some time ago, but those ships are now practically completed, and soon there would be nothing left to do except Government work. He hoped that the bill would be passed and the work of investigation begun as soon as possible.

The committee reported the bill favorably to-day.

W. L. C.

#### The Colorado Fuel Bond Offer.

The offer to the bondholders of the Colorado Fuel & Iron Company to deposit their bonds under the plan by which it is proposed to increase the amount of bonds from \$14,068,000 to \$45,000,000 has been extended to January 23. The amount of bonds so far deposited under the offer is \$9,835,000, or over \$2,000,000 in excess of a majority. These certificates of deposit have been listed on the Stock Exchange.

According to the application for listing, the syndicate has agreed to underwrite without commissions so much of the proposed new issue of bonds and stock as may be necessary to provide the cash requirements on a basis of a \$1000 bond and \$200 of stock for each \$800 paid. The bonds and stock thus underwritten are to be offered to the stockholders at the underwriting price, the members of the syndicate waiving as stockholders the right to participate. The bonds and stock not so taken by the stockholders within a time to be specified by the committee are to be offered to the debenture holders depositing under the plan in the proportion of their holdings at the underwriting price, the members of the syndicate as debenture holders waiving the right to participate. Any balance remaining of the bonds and stock will be taken and paid for by the syndicate. Provision will be made for payment of the next maturing coupon on the debentures thus deposited in case the plan becomes effective.

Officers were elected January 14 at the annual meeting of the New York Metal Trades Association, at 203 Broadway, as follows: President, W. F. Palmer of the Quintard Iron Works; vice-president, Charles L. Seabury of Charles L. Seabury & Co. and the Gas Engine & Power Company; treasurer, M. K. Bowman of the James Riley Repair & Supply Company; secretary, H. C. Hunter, 203 Broadway; Executive Committee, Wallace Downey, Andrew Fletcher, Jr., H. N. Covell, Christopher Cunningham, and Robert S. Wyatt.

The Whitehead Machinery Company, Davenport, Iowa, announce their removal to enlarged quarters on the third floor of the Hagebreck Building on West Second street.

## The British Metal Trades in 1903.

LONDON, January 9, 1904.—On turning back to my annual report last year I find in the last paragraph, dealing with future prospects, the following words: "I cannot see a particularly brilliant prospect in the home market for the coming year. It seems, indeed, to be merely a question of fending off trade depression for yet a little longer. It may be that with the improved organization of the trade it will be possible more effectively to control prices and so to prevent the worst forms of a trade slump." This is very much what has happened. The early part of the year saw the completion of many contracts, with a considerable shrinkage in the number and volume of subsequent contracts. The South African market, both in the light and heavy departments, was a capital standby for the first nine months of 1903, but after that glutted markets and difficulties of transportation brought their inevitable reaction. In previous periods of incipient depression strikes and lockouts have been unhappily the order of the day. It can be said this time that the better organization of the trade, both among employers and employees, has not only prevented the market from becoming a panic and a rout, but has also prevented any serious industrial warfare. In a quite unmistakable manner the whole market has marched together.

### The Culmination of an Epoch.

In writing of the year 1903 it seems as if we were considering the end of the century instead of its third year. It marked the culmination of a period—a small epoch. For not only has it witnessed the termination of a period of prosperity beginning in the autumn of 1898, but it has also witnessed a large body of business men, deeply concerned with the competitive capacity of both America and Germany, looking to a rearrangement of the tariff system to ease their condition and render them economically stronger in the home market. Had any responsible journalist on January 1, 1903, prophesied a strong recrudescence of protectionist opinion in Great Britain within a few months, his reputation would have been lost.

It is true that those of us who have watched closely the proceedings of the Chambers of Commerce have not failed to observe a marked tendency among the manufacturing sections to look to the Government for more effective support. Commercially it may be said that the last decade witnessed the death of the old industrial individualism, which was so marked a feature of the free trade era. But that manufacturers should have gone to the Government demanding a protective tariff was certainly more than most of us expected. I think I may go further and assert that it was more than Joseph Chamberlain himself expected. In introducing his scheme of preferential tariffs he was careful to dissociate himself from what in this country is termed the protectionist heresy. But he speedily discovered two vital facts in the situation, the first being that the British colonies, upon which he had relied for effective support, were either lukewarm or indifferent to his proposals; and, secondly, that a retaliatory tariff on a protectionist basis was vastly more popular than he had ever anticipated. The result was that in three months or so from the start of his campaign he found it politically necessary frankly to admit himself a "new recruit" to the theory of protection.

It will be admitted, even by his opponents, that he has developed more strength than they anticipated, but none the less, level headed observers are convinced that his proposals will be defeated at the polls. Be that as it may, it is certain that the new fiscal campaign has had a seriously depressing effect upon commerce. With a general election looming in the distance there is always some commercial unsettlement, but when such an election is fraught with such stupendous issues, it is not surprising that business men have deliberately hung up their future schemes until they know more definitely what the electors think of the relative merits of free trade and protection.

### Some Fortunate Conditions.

Externally we have been more fortunate than we had a right to expect. It was generally assumed at the beginning of the year that before many months had elapsed American competition would be upon us with a severity

reminiscent of the years 1896 to 1898. In 1902 America bought from Great Britain over 800,000 tons of iron and steel of various kinds. This rate of supply was maintained in the early months of 1903, but subsequently, as your readers are doubtless painfully aware, there was no further urgent need for British or German iron and steel. The point of my observation is, however, that American trade continued active well into the year, with the consequence that the competition so many British makers feared did not occur.

But spared though we were from the worst forms of American competition, Germany did not let us down so lightly. The German depression, toward the end of 1901 and in the early months of 1902, is now a matter of history. The American boom was a godsend to the Germans, sending as they did across the Atlantic over 350,000 tons of German iron and steel. But with the shrinkage of the American demand for the German commodity, it was not surprising that Germany turned her attention to this country, and to some purpose, too. In 1903 Germany produced more than 1,500,000 tons of pig iron in excess of her output the previous year. Great Britain has felt the full force of this increased productivity. A responsible authority thinks that British imports of German iron and steel will be well over 1,000,000 tons, of which one-half is finished material. This is surely in the nature of an invasion, and has undoubtedly adversely affected the British home market. And it is in part because of these facts that the present political agitation against "dumping" possesses so much vitality.

### Trade Conditions in Important Centers.

Taking the trade as a whole, as has already been said, the tendency has been downward, but certain of the metal centers have suffered more than others. Those districts mostly affected by shipbuilding have suffered more than other districts which depend upon a more comprehensive demand. A few short observations upon the state of trade in the various districts may make the situation clearer. In Barrow-in-Furness the hematite pig iron trade opened favorably, with makers well sold and 33 furnaces in blast; the year closed with only 15 furnaces in blast and six of those temporarily damped down owing to the holidays. Warrant stocks began at 23,133 tons; the year ended with a reduction to 13,550 tons. It is estimated, however, that makers hold something near to 150,000 tons. In Birmingham low prices have been the order of the day, and many and strong have been the complaints on this head. Keen competition on the part of German and Belgian makers, both of iron and steel, has had to be met, but labor disputes have been agreeably absent. In the Cleveland district conditions were unfavorable, but on the whole this district has done better than had been hoped for. Although America only bought 80,000 tons in 1903, as compared with 200,000 tons the previous year, Cleveland shipments of pig iron have been maintained, reaching, it is estimated, to 1,215,000 tons, as compared with 1,142,000 tons in 1902. Newcastle has two great industries, shipbuilding and coal mining. In shipbuilding there was a reduction of 60,000 tons compared with the previous year, and workmen's wages suffered. In the coal trade values have been evenly maintained, and the collieries all report a satisfactory year. Sheffield had a very bad time. There has been a serious lack of employment throughout the year. If it has not been one department, then another has been slack.

### Engineering.

In mechanical engineering, which is, after all, the practical test, trade, without being actually bad, has been far from good. Prices have not been so remunerative, contracts have not been so big, and there has not been any large undertaking to strike the public imagination. Like the extractive industries in the iron and steel department, the engineering industry has been wonderfully free from labor disputes, although more than once it seemed as if we were on the verge of a serious conflict. In the relations between employer and employed two interesting departures may, with more or less accuracy, be set down to last year; the first an organized attempt on the part of engineering employers more effectively to



train their apprentices in the technique of their profession, and the second a distinct advance toward the premium system. Several firms in 1903 for the first time adopted it.

Apart from this, the even tenor of the engineering year was ruffled by the extended use of the steam turbine, mainly for marine propulsion. It is probable that 1903 saw the complete establishment of the turbine as a practical engineering proposition.

In electrical engineering, the most noticeable feature has been the great increase in the number of British municipalities who have become valuable customers of the electrical engineer. Further, the railroad companies of Great Britain began last year seriously to consider how far they could utilize electrical energy in effecting those economies which financial stringency and other causes have rendered imperative.

On the export side the makers of machinery have had a good year, the total value reaching £20,065,916, an increase of £1,311,101 compared with 1902 and an increase of £2,253,572 compared with 1901.

#### Shipbuilding.

As nearly as can be ascertained, the number of vessels launched all over the world during 1903 was 2,441, with a tonnage of 2,679,531, with indicated horse power of 2,352,485. Compared with 1902 this is an increase in the number of vessels, but a decrease both in tonnage and power. These figures bear out assertions that have been made in this column from time to time that the tendency during the year has been to build tramps rather than liners. The following table sets out the full shipbuilding output for the whole world for last year as compared with 1902:

	1903.		1902.	
	Vessels.	Tons.	Vessels.	Tons.
Scotland .....	362	484,853	404	566,553
England .....	871	766,295	937	891,109
Ireland .....	25	158,482	27	158,573
United Kingdom, totals .....	1,258	1,409,630	1,368	1,616,235
Colonial .....	96	37,225	86	24,700
Foreign .....	1,087	1,232,676	939	1,074,735
Grand totals....	2,441	2,679,531	2,393	2,715,670

It will thus be seen that Great Britain had a higher output than all other countries combined, even if we include among other countries Great Britain's own colonies. There was a decrease in the output on the Clyde, the Tay, the Dee, the Tyne, the Wear, Tees and Hartlepool, the Thames, in Ireland, Germany, France and Holland. Once again Belfast holds the record for total tonnage and largest vessels from the yard of any single firm. Needless to remark, it is Harland & Wolff to whom I refer. This great Queen's Island enterprise produced far and away more tonnage and bigger ships than any other company. Of course, the tonnage of the American Shipbuilding Company, with their seven yards, is higher, but the comparison hardly holds.

From the dockyards during the year one battle ship one armored cruiser and two sloops have been launched of a total displacement of 28,290 tons, as against five vessels in the preceding year of 51,560 tons. The output of the private yards has been three battle ships, three armored cruisers and two protected cruisers of an aggregate displacement of 85,650 tons, besides torpedo craft and submarines. This is a larger output than that of 1902, when the heavier vessels that took the water consisted of four armored cruisers, displacing 39,200 tons. If we include in the output of the private yards the tonnage of the two ex-Chilean battle ships purchased by the Government, and also that of the small craft, we reach an aggregate displacement of more than 120,000 tons. The great difference between the output of the private and of the public yards is due, at least in part, to the larger use made of the latter establishments for refitting ships, a factor which will not operate to the same extent in the future, owing to the decision of the Admiralty to have many vessels refitted by the contractors. The working of this new arrangement, and of another by which vessels built by contract are to be completed for service in private establishments, will be watched with great interest.

#### The Year's Export Trade.

As often happens when trade slackens at home, there follows a stimulation of the export trade—a species of "dumping," by the way. This is what happened during 1903. In nearly every department a distinct advance was made, both in the tonnage and value, as is clearly shown in the following figures:

	1901.	1902.	1903.
Iron and steel and manufactures thereof.....	£25,008,757	£28,877,337	£30,453,190
Other metals and manufactures thereof.....	6,832,223	6,269,652	6,961,153
Cutlery, hardware, implements and instruments..	4,175,441	4,384,672	4,636,606
Telegraph cables and apparatus .....	3,147,985	2,838,641	1,808,136
Machinery .....	17,812,344	18,754,815	20,065,916
Ships (new).....	9,149,444	5,871,575	4,285,485

The increase in the export trade to South Africa continued during most of the year, but fell off toward the end. The South American market throughout 1903 was fruitful in every sense. We bought more foodstuffs from Argentina in consequence of the removal of restrictions on live stock, and we paid for it in increased exports of various kinds. Our trade with the Continent of Europe in the heavy departments must, on the whole, be set down as unsatisfactory, although the industrial revival in Spain and Italy helped to equalize things. The trade with France continued as usual, fair, both in volume and value. The trade with Germany was uneven, but we gained in our trade with Russia as compared with either Germany or the United States. The fiscal differences between America and Russia hurt American trade both on the import and export side.

#### Future Prospects.

All appearances point to a persistence of the downward tendency in the iron and steel markets. It should, however, be remembered that for the last seven or eight months consumers have consistently adopted a policy of buying from hand to mouth. It is undoubted, I think, that private stocks are now exceedingly low, and before long there must be heavier purchases, which may tend slightly to stiffen prices. Much, indeed almost everything, depends upon the course of the American market. If we are to have an American invasion slaughter prices will be the order of the day, and, as far as can be humanly foreseen, nothing can prevent it unless American works are remorselessly shut down, or the American home market develops unexpected strength.

War between Japan and Russia may stimulate certain industries that thrive on militarism, but the net result cannot fail to accentuate our depression. Such a war must restrict trade throughout the far East, not only with Japan itself, but with China and India. The question in the minds of many men at the present moment is whether the trade depression will last longer than the period of boom, which is now just closing. Personally, I cannot but think that we are feeling our way, slowly and surely, into a commercial system which is better able to regulate supply and demand than ever before in the world's history. It is certainly passing strange if with all our experience organized human will power is not equal to coping with these two economic forces.

S. G. H.

**The Duty on Soft Coal.**—Bituminous coal is now subject to the duties imposed by the Dingley tariff act. On January 15, 1903, the act of Congress was approved which provided for a rebate of the full duty for one year, thus making bituminous coal free for that time, which expired last Friday. No action has been taken by Congress to continue the rebate, and the duty will probably stand until the tariff undergoes a general revision. Anthracite coal is not subject to a duty.

The Stiles-Morse Company, Chicago, Western distributing agents for Chicago and vicinity for E. W. Bliss Company, have removed their office and salesroom from 16-18 South Canal street, Chicago, to 65 West Washington boulevard, where they will carry a line of presses, punches and other machines made by the above company.

## MANUFACTURING.

### Iron and Steel.

The Edgar Thomson Steel Works of the Carnegie Steel Company, at Bessemer, Pa., which have been closed down for about a month for repairs and extensive improvements, is now in full operation. The most important change was made in the roll department, where a new engine was installed to operate the roughing rolls. Other changes consisted in installing new hot saws in the rail mill, new rolls in the finishing mills, and the overhauling of the rolls in the blooming mill. The machinery was tested last week in the presence of the superintendents of the various departments of the plant and officers of the Carnegie Steel Company.

The Continuous Rail & Mfg. Company, Stevenson Building, Indianapolis, Ind., have incorporated with a capital stock of \$2,000,000 for the manufacture of Crabb's continuous nonbreakable rail, which is a compound rail made in three sections. The company expect to erect a rail mill with a daily capacity of 500 tons, but as yet have not decided on a location. In the meantime they will have their rails made by contract. The officers are J. F. Messick, president; J. N. Crabb, vice-president and general manager, and W. A. Zumpfe, secretary and treasurer.

The East Works of the American Iron & Steel Mfg. Company, at Lebanon, Pa., have resumed operations after an idleness of about a month. The plant has now more work on hand than at any time since the strike of 1902.

No. 1 blast furnace of the Pennsylvania Steel Company, at Steelton, Pa., has been put out of blast for repairs. Nos. 2 and 4 blast furnaces are again in operation, as is that of the company at Lechiel. A number of mills that had been idle for a month were put in operation this week.

Two mills of the Susquehanna Iron & Steel Company, at Columbia, Pa., were put in operation on Monday morning, January 18, after an idleness of several months. The receiver announces that it is his intention to start operations at the Columbia pipe mill as soon as possible, possibly within a month. The pipe mill has been in the course of building for about two years.

The new 140-inch plate mill at the Homestead Steel Works of the Carnegie Steel Company was formally tested on Friday, January 15, and was found to work very satisfactorily. This is one of the largest plate mills in the world, but it will not be fully completed for some little time yet.

The new plant of the Sligo Iron & Steel Company, at Connellsville, Pa., was put on double turn last week. The plant turns out bar iron and plates.

At Clarksburg, W. Va., on January 13, Charles D. Elliott was appointed temporary receiver for the Jackson Iron & Tin Plate Company of that city. The plant has been closed down for several months on account of court proceedings. The appointment of a permanent receiver will be decided January 20. It is thought the plant, which is valued at \$500,000, will be sold to pay creditors.

Orders have been received to operate the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio, full time hereafter. The plant has been running only partly full on sheet and tin bars, but is now expected to operate to utmost capacity and will probably turn out from 2000 to 2500 tons of steel per day.

The American Bridge Company have received a contract for about 1000 tons of structural steel for shipment to Peru.

McKinley Furnace of the Carnegie Steel Company, at New Castle, Pa., was blown in on January 14 after an idleness of some weeks. Common labor at this furnace has been reduced from \$1.60 to \$1.40 per day and other labor in proportion.

The report that orders had been issued by the Carnegie Steel Company to operate the Ohio Works, at Youngstown, Ohio, to full capacity, or to increase the present output, is untrue. The report that the Niles Furnace of the Carnegie Steel Company, at Niles, Ohio, would be started at an early date, is also untrue. Some repairs are being made to Niles Furnace, which probably gave rise to the rumor that it was to be put in blast. It will likely be some time before this furnace is started.

The Shenango Works of the Carnegie Steel Company, at New Castle, Pa., which have been idle for several months, started up on Monday, January 18. The wages of tonnage men at this plant have been materially reduced, and in some departments the men will work two turns instead of three, as heretofore.

The Tyler Tube & Pipe Company, Washington, Pa., manufacturers of charcoal iron boiler tubes, have received a large contract for boiler tubes for the Mexican Government. The billets for the manufacture of these tubes are imported from Sweden.

Blast Furnace E of the Carnegie Steel Company, at Bessemer, Pa., was put in blast on Sunday, January 17. Furnace D at this plant was also started last week, and stack G will be put in blast some time this week. This will leave only one furnace out of 11 at Bessemer that will be idle.

The Colonial Iron Company, New York, have incorporated with a capital stock of \$150,000 for the manufacture of pig iron and the development of iron properties. At the head of the

enterprise is H. H. Adams, Sr., pig iron merchant, 177 Broadway, New York.

Phineas D. Pierson has been appointed receiver for the Rockaway Iron & Steel Company, Rockaway, N. J.

Last week 10 of the 20 hot mills in the tin plate plant of the American Sheet & Tin Plate Company, at South Sharon, Pa., were started up. It is probable the other ten mills will be started at an early date.

The National Rolling Mill Company, Hartford City, Ind., have increased their capital stock from \$50,000 to \$150,000.

Fannie Furnace of the Cherry Valley Iron Company, at West Middlesex, Pa., is expected to blow in between March 1 and 15 next.

Mattie Furnace of the Girard Iron Company, at Girard, Ohio, will resume blast about January 25.

The plant of the Canonsburg Steel & Iron Works, at Canonsburg, Pa., has been closed down for about two weeks, making needed repairs, but started up in full operation on January 12. The company are manufacturers of steel and iron sheets for stamping, enameling, deep drawing, tinning, galvanizing and stove and range work. The report that a strike had occurred at their plant is untrue.

The McKeesport Tin Plate Company of Pittsburgh have started up ten hot mills in their tin plate plant near McKeesport, Pa. The plant is nonunion, the same rate of wages being paid as prevail in nonunion mills of the American Sheet & Tin Plate Company.

### General Machinery.

The Automatic Feeder Corporation have been organized under Connecticut laws with a capital stock of \$200,000. The incorporators are: President, Edward A. Harriman; William L. Barnett of Derby, Conn., and S. Bigelow Cheney of New Haven. They will manufacture feeders for tack, nail and other machines. The company are not yet ready to make announcement of their further plans.

The Wichita Bridge & Iron Company, Wichita, Kan., are making improvements to their plant, which involve an expenditure of about \$25,000. These extensions consist of an addition to their machine shop and the building of a new foundry. The old foundry is to be used for structural iron work.

A steam traction engine especially adapted for prairie land will be manufactured by the Geiser Mfg. Company, Waynesboro, Pa. It will be of 25 horse-power, capable of drawing a 25 horse-power plow. The tires will be 36 inches wide.

The Dean Electric Company, Elyria, Ohio, have organized with a capital stock of \$300,000 to manufacture telephone switchboards and electrical apparatus. The company are building a modern factory, and report being in the market for power apparatus and machinery equipment. Officers of the new corporation are: President, S. B. Rawson; vice-president, W. W. Dean; secretary, A. E. Barker, and treasurer, T. M. Brush.

The Metal Sectional Furniture Company of Chicago will erect a plant at Benton Harbor, Mich., in the spring for their line and in addition will conduct a general machine shop business.

The C. O. Bartlett & Snow Company, Cleveland, O., have received an order from the Dakota Pressed Brick Company, Deadwood, S. D., for one of their rotary dryers for drying 50 tons of sand a day, also conveying machinery.

L. C. Tarras, Winona, Minn., has leased a large building in that city and will install a modern machine shop, machinery equipment for which has been purchased and is now on the way.

The Cushman Chuck Company, Hartford, Conn., have not yet fully decided to erect a new plant. It was their intention to do so a few months ago, but they have laid their plans aside for the present and will do nothing in the matter for some time to come.

The Kelly & Taneyhill Company, Waterloo, Iowa, manufacturers of well drilling machinery, are having a very good demand for their well drills and have booked a number of orders to be shipped to foreign countries.

The Swift Mfg. Company, Waterloo, Iowa, manufacturers of grinders, are enjoying a good trade.

The large new car repair shops of the New York, New Haven & Hartford Railroad, at Readville, Mass., are completed but are not yet in full operation. In some of the departments work has been going on for some time. At present there are about 300 men employed at the shops, and this force is being increased daily.

The Central Trust Company and Henry J. Martin have been appointed receivers for the Indianapolis Forging Company, Indianapolis, Ind., who are authorized to borrow \$15,000 with which to operate the plant. The liabilities are placed at \$35,000.

The Stilwell-Bierce & Smith-Valle Company, Dayton, Ohio, manufacturers of mill machinery, pumps, &c., have been adjudged an involuntary bankrupt by the Federal Court.

The plant of the Hemphill Machine Company, Central Falls, R. I., has been purchased by the Mayo Knitting Machine & Needle Company, Franklin Falls, N. H., who will move it to the latter place in the spring.



The plant of the Standard Engineering Company at Ellwood City, Pa., is running smoothly. The Ellwood Power Company have erected a transmission line to this plant, and it probably will be only a short time until much of the machinery will be operated by electric power, generated at the power company's new plant on the Connoquenessing River, within the city limits.

The plant of the New York Blower Company, at Bucyrus, Ohio, one of the properties involved in the recent embarrassment of E. Penfield of New York, has been sold to Mathews Brothers' Company of Chicago. The sale was made by Myron H. Wilson of the Cleveland Trust Company. It is understood that the new owners will continue the manufacture of the same line and that they will enlarge the plant.

The Willard Storage Battery Company, Cleveland, Ohio, manufacturers of storage batteries, have moved into larger quarters at Twenty-seventh and Clair streets, and will make extensive improvements to the building. They will install 200 horse-power of boilers and engines and two 75-kw. generators for lighting and power. They will buy considerable new machine tool equipment and will install a complete wood working equipment for manufacturing their own battery cases. T. A. Willard is general manager.

The Reade Machinery Company, Cleveland, Ohio, who recently sold their patterns and drawings for their line of punching and shearing machinery to the George B. Sennett Company, Youngstown, will continue to devote their attention to the sale and repairing of second-hand machine tools of large size. At their shops at Collinwood they are at present doing a large amount of work in the repairing of locomotives.

The Patterson Tool & Supply Company, Dayton, Ohio, have just shipped one of their 15-inch friction driven disk drills to the Government works at St. Petersburg, Russia.

#### Power Plant Equipment.

The Schaghticoke Electric Power Company, Schaghticoke, N. Y., have engaged Chas. E. Collins, hydraulic engineer, Drexel Building, Philadelphia, to prepare plans and specifications with estimates for a power plant on the Hoosick River at that place. About 3500 horse-power will be developed by water power and one 1000 horse-power steam unit will also be installed.

The R. Munroe & Sons Mfg. Corporation, Pittsburgh, boiler makers and engine builders, have recently executed some large contracts. Among these was the installation of ten 100 horse-power boilers for Dilworth, Porter & Co. of Pittsburgh, and the furnishing of two 150 horse-power Munroe water tube boilers to the American Structural Steel Company, at Carnegie, Pa. The concern will soon make a shipment of some large bi-product tanks to Tuscaloosa, Ala., and have received an order from a water company for a tank 50 feet in diameter and 40 feet high.

The only equipment required by the Altman & Taylor Machinery Company, Mansfield, Ohio, whose foundry was recently damaged by fire, is a complete set of line shafting, which will be ordered soon. Very little of the machinery was damaged beyond repair. The only machine which they were compelled to purchase was a grinding machine, which was bought from the N. Baird Machinery Company, and which was manufactured by the Webster & Perks Mfg. Company, Springfield, Ohio.

The Brandon Machine Works Company, Limited, Brandon, Man., capitalized at \$125,000, are to build a larger molding shop to take care of their work. They are builders of portable threshing engines, separators, boiler makers, &c., and last year built 30 portable engines besides their regular new and repair work. About two years ago the company enlarged their works and installed pneumatic tools.

The Lunkenheimer Company, Cincinnati, Ohio., makers of superior brass and iron steam specialties, report that, owing to the unprecedented and growing demand for their specialties, they have again greatly increased their facilities and are now in position to guarantee reasonably prompt shipments. They also report through their foreign branches an increasing export demand for their specialties. They will shortly place some new specialties upon the market which will be contained in a very complete catalogue to be issued in the course of a few months.

The International Steam Pump Company, New York, have placed orders with the General Electric Company of Lynn, Mass., for direct connected motors for pumps to go into Mexican mines. They will vary in size up to 200 horse-power and will operate pumps having capacities of from 100 to 1500 gallons a minute, with long heads.

It is understood that the Fall River Electric Light Company, Fall River, Mass., are considering making important improvements to their power station the coming season.

The Marine Boiler Works Company, Toledo, Ohio, have increased their capital stock from \$100,000 to \$125,000. The company are planning to add to their equipment and will probably erect a new building. They are extremely busy on marine work, and among other large boilers they are building four large boilers for the side wheel steamer being built by the Craig Shipbuilding Company, at Toledo.

The Sidney Gas & Electric Light Company, Sidney, Ohio, are planning to install two new engines, an incandescent light generator and make other improvements.

The firm of Pittsburgh, Boiler & Engine Company, 904 Park Building, Pittsburgh, are now entirely in the hands of D. Ashworth, S. A. Williamson having retired from the concern on January 15. Mr. Ashworth is taking active measures to extend the business in the line of power and transmission.

D. M. Stewart and Charles Darlington, Xenia, Ohio, have organized a lighting company and are securing estimates on the cost of equipment for a plant large enough to illuminate the town and furnish current for private lighting and manufacturing purposes.

The Williams Air Compressor Company have been incorporated at Indianapolis, Ind., with \$40,000 capital stock, for the manufacture of automobiles, automatic air brakes, air compressors, engines and motors. The incorporators are John W. Williams, A. G. Schonacker and John M. Pietzuch.

#### Foundries.

A foundry for the manufacture of agricultural implements and builders' equipment will be established at Nescopeck, Luzerne County, Pa. Roy Sholes of Berwick, Pa., is at the head of the project and expects to have his plant in operation by the first of the coming April, with a daily capacity for 5000 pounds at least. Mr. Sholes has long been at the head of a foundry in Berwick. Nescopeck's Council has exempted the foundry from taxation.

William H. Holcroft & Co., Chester, Pa., engineers and contractors, will build for the Brylson Steel Casting Company, at Chester, three 100-foot stacks, three furnaces and ovens, engine and boiler house, and several iron buildings.

The Fremont Foundry & Machine Company, Fremont, Neb., have added a new cupola in their foundry department.

W. H. Harris, formerly sole owner of the Harris Foundry Company, Lockport, N. Y., has perfected and patented an improved furnace for house heating, and will this week begin the erection of a factory, 100 x 150 feet, adjoining the tracks of the New York Central Railroad in that city, in which these furnaces will be manufactured, giving employment to about 100 men.

The Frontier Iron Works, Buffalo, N. Y., have been sold to W. F. Simon, Jas. W. Murphy and Robt. C. Palmer of that city, who have reorganized the company and will continue business under the old name with Mr. Simon as president, Mr. Palmer as vice-president, and Mr. Murphy as secretary and treasurer. The plant will be enlarged in the spring.

The Eagle Foundry Company, Incorporated, Salem, Mass., are a new Massachusetts corporation, with capital stock of \$12,000. Alonzo H. Smith is president and treasurer. The business is an old one.

The business of the Smith Iron Foundry, Lynn, Mass., has been incorporated as the Smith Iron Foundry, Incorporated, under Massachusetts laws, with capital stock of \$12,000. Albert F. Smith is the president and Alonzo H. Smith the treasurer. The business has been conducted for 20 years.

#### Bridges and Buildings.

Contract for the construction of the ten-story fire proof building to be erected by Martin A. Ryerson, Chicago, has been secured by Wells Brothers Company. The building will cost about \$325,000. The structure will occupy an irregular piece of property, fronting 75 feet on Adams street, with the south end of the building fronting on Quincy street, and adjoining on the west Mr. Ryerson's present six-story structure on the southwest corner of Adams and Market streets. The exterior construction will be of paving brick with Dutch bond, and the interior of steel frame with floors and partitions of hollow tile. The building will require 1200 tons of structural steel, contract for which has not been let.

The R. F. Hawkins Iron Works of Springfield, Mass., have been incorporated under Massachusetts laws, with a capital stock of \$35,000. Richard F. Hawkins is president and treasurer. The company build bridges and do all other structural iron works and build boilers and stacks.

The property of the Wabash Bridge & Iron Company, Wabash, Ind., including the real estate and equipment, will be sold February 13 by order of the court, which has instructed Trustee Wilkinson to wind up the company as quickly as possible and distribute the proceeds to the creditors.

#### Fires.

The Cedar Point Foundry, at Port Henry, N. Y., owned by A. Tromblee & Sons, was recently burned. The machine shop adjoining was saved.

The foundry of the Alamo Mfg. Company, Hillsdale, Mich., manufacturers of gasoline engines, was recently destroyed by fire.

The blacksmith shop and some other departments of the Cunningham Glass Works, Pittsburgh, Pa., were destroyed by fire January 15. The loss is placed at \$50,000.

The extensive plant of the Locke Brothers Shoe Company, Wheeling, W. Va., was destroyed by fire January 17.

On January 17 fire in the Chicago Consolidated Milling & Melting Company's plant at Chicago caused a loss of \$75,000.

The coal breaker and washery of the Delaware & Hudson Company, at Olyphant, Pa., was destroyed by fire January 17. The loss is placed at \$110,000.

The malting house of the Hinchcliff Brewing Company, Paterson, N. J., was destroyed by fire January 15. It contained a large amount of machinery.

The large factory in Amesbury, Mass., occupied by the Burbank Carriage Company and the Charles F. Worthen Carriage Company, was destroyed by fire January 18. The total loss will aggregate \$50,000.

The South Dunn Furniture Company's plant at Dunn, N. C., was recently destroyed by fire. The loss is \$50,000.

The recent slight fire in the spinning department of the George A. Ray Mfg. Company, copper, brass and plated goods, Buffalo, N. Y., will in no way delay shipment of orders. The company anticipate working to full capacity within the next few days.

#### Hardware.

The Stowell Mfg. & Foundry Company, manufacturers of hardware, South Milwaukee, Wis., during the past year increased their capital stock from \$175,000 to \$200,000. They purchased an acre of property adjoining their plant, and on it are now building an office building, which will be completed this spring. An addition, 56 x 110 feet, was made to their machine shop. The company have added hay tools to their line of manufactures. The company are looking for a good trade during 1904.

The Elliott Mfg. Company, Warren, Ill., have just completed additions to their buildings, which give them double office space and considerable more factory room. Plans are well under way for the erection of a brick and steel addition, 30 x 80 feet, for the accommodation of their heat, light and power plants and also their retinning and galvanizing departments. Their output for 1903 exceeded that of 1902 by over 30 per cent.

The Port Huron Steel & Screw Company, Limited, Port Huron, Mich., have installed a new boiler, new engine and two new electric generators in their power plant.

The A. J. Lindemann & Hoverson Co., Milwaukee, Wis., expect to make some enlargements and improvements in their factory during the year 1904, but plans have not yet fully been decided. Their output for the past year was approximately 30 per cent. greater than that of 1902, and they look for a continued satisfactory business.

The Cleveland Cap Screw Company, Cleveland, Ohio, are now completing machinery which, when installed, will increase their capacity to four times what it was in 1902. Their output during 1903 was double that of 1902, there being a very satisfactory export business on the large sizes of finished cap screws and bolts. In the manufacture of their product the head of the screw is electrically welded onto the shaft, saving the loss of time and material incident to turning down a large square or hexagon bar.

The Rockford Tack & Nail Company, Rockford, Ill., have added to their equipment during the past year 20 new tack machines, a large chopper, and a complete tinning department in which they do their own tinning on tacks and nails, as well as general job tinning for other manufacturers who do not have their own tinning department. Proposed improvements for 1904 consist of new tanks, punch presses and rattling barrels. The company's output for 1903 was 800,000 pounds, which was a material increase over the business of 1902.

The Todd Mfg. Company, New Albany, Ind., manufacturers of steel hames and chains of all kinds, have erected a one-story chain factory, 50 x 280 feet, and a hame factory, two stories high, 50 x 280 feet, at New Albany, and have purchased at receiver's sale the business of the Cincinnati Hame Company, the combined facilities giving them one of the largest hame factories in the country. They report an excellent demand for their steel hames and the making of large shipments to Canada, Mexico, Australia and South Africa. In erecting the chain factory they have discarded coke as fuel and will use the Acme gas system for chain fires. The company are looking forward to a very satisfactory business in their entire line during 1904.

The Milwaukee Tack Company, Milwaukee, Wis., report that their approximate output for 1903 was not quite as large as that for 1902, owing to the difficulty in procuring labor. They believe that an increased business may be looked for in 1904, for the reason that dealers are carrying a limited stock at the present time.

The American Chain Company, Zanesville, Ohio, experienced a volume of business during 1903 about equal to that of the previous year, and state that trade conditions in their line are as good at present as they have been any time during the past year.

The Tower Mfg. Company, manufacturers of all kinds of tacks, staples, rivets, nails, &c., Madison, Ind., have remodeled their cooper shop, putting it in shape for manufacturing purposes. The building is 32 x 200, with basement the full size of the structure. They have added to their equipment during the past year a 200 horse-power Bates-Corliss engine, 40 tack machines, 12 small nail machines, 3 washer presses, a 16-inch shaper, a 2-inch spindle drill press, 2 internal and external

grinders, 3 emery grinders, 4 rattlers, and other tools needed for handling the additional machinery and the output.

The capital stock of the Granger Implement Company, Fort Dodge, Iowa, has been increased from \$50,000 to \$75,000.

The plant of the Penn Shovel Works, at Corry, Pa., has been destroyed by fire. The plant will probably be rebuilt, but this has not been fully decided.

The Pittsburgh Bolster Spring Company have been organized by Albert, Harry C. and Charles J. Graham of the Graham Nut Company of Allegheny, Pa. The new concern will manufacture the Reiter patent bolster spring for vehicles.

The old factory at Bristol, Conn., occupied by the Wallace Barnes Company, spring manufacturers, for their blacking department, was destroyed by fire January 3, with a loss of \$5000. The building was nearly a century old and for most of the time was occupied by various hardware and clock manufacturers.

The International Mfg. Company, Scranton, Pa., who commenced operations about a year ago, are manufacturing a door hanger, three different kinds of wrenches and a hame, all of which are patented articles. H. P. Decker is president of the company, L. L. Spruks vice-president, and C. R. Shryer secretary and treasurer.

The Warner Silver Mfg. Company, Chicago, will remove shortly to Dixon, Ill.

#### Miscellaneous.

The annual meeting of the Washington Coal & Coke Company was held last week at Dawson, Pa., at which the old Board of Directors was re-elected, as follows: M. M. Cochran, W. Harry Brown, J. S. Newmeyer, J. H. Wurtz, Sarah B. Cochran, N. A. Rist, E. J. Taylor, J. C. Core and A. O. Sherrard. The officers of the company are: M. M. Cochran, president; W. Harry Brown, vice-president; J. H. Wurtz, secretary and treasurer, and J. S. Newmeyer, general manager. N. P. Hyndman, Conestoga Building, Pittsburgh, is sales agent.

The Buffalo Fireproof Lath Company have been incorporated at Buffalo, N. Y., with a capital stock of \$25,000. The directors are John F. Malone, Robert L. Cox and Henry Ginnane of Buffalo.

Vaux & Co. have incorporated at Buffalo, N. Y., with a capital of \$10,000, to manufacture and deal in heating and ventilating apparatus. The directors are Frederick G. Vaux, Albert J. D. Laplante, Wm. H. Beam and Jackson A. McBurney.

The C. H. Hard & Reed Company have succeeded to the business of C. H. Hard, manufacturer of woven wire mattresses, Buffalo, N. Y., and will occupy a five-story factory at 154-158 Oak street after May 1.

The Middletown, Pa., Car Works will resume operations in full about February 1. The company have booked an order for cars for the Berwind White Coal Company of a pattern designed by Arthur King of the Middletown plant.

Advices from Scottdale, Pa., are to the effect that orders have been issued by the H. C. Frick Coke Company for the immediate resumption of 1500 additional coke ovens, making 3000 ovens started since January 1. The Rainey Coke Company have also blown in 500 ovens in that district.

J. D. Davis & Son, Wilmington, Del., makers of iron railings, are preparing to move into their new plant, at Fifteenth and French streets, which is now ready for occupancy.

The Smith Premier Typewriter Company, Syracuse, N. Y., started operations in their large new works on Gifford and Dickerson streets, January 4. The building is seven stories high and is light and airy, being equipped with improved ventilating apparatus. The mechanical equipment is of the very best and includes several special machines for manufacturing typewriters which were invented by Alexander T. Brown, vice-president. The new plant has an output of 150 typewriters per day, which is expected to reach 200 per day a year hence. The company's business for 1903 increased 30 per cent. over that of the best previous year.

The Atlantic City Gas & Water Company, Atlantic City, N. J., will build a new purifying house, 46 x 186 feet, in which will be placed four purifying boxes and two station meters. The Isbell-Porter Company, Newark, N. J., have the contract for the purifying boxes and the rest of the iron work. The cost of the improvement will be about \$60,000.

The Taylor Coal Chute Mfg. Company, Kewanee, Ill., have incorporated with a stock of \$5000, to manufacture a steel folding coal chute. The incorporators are W. H. and R. E. Taylor and O. H. Myers. The company have a small plant in operation at present and may be in the market for machinery in the future.

At Butler, Pa., notice has been given to satisfy a lien against the Standard Steel Car Company of that place, amounting to \$1,000,000. This means that this concern in 15 months have been able to lift and cancel one-half of the \$2,000,000 of bonds issued at their inception.

E. H. Stafford & Brothers, Chicago, manufacturers of church and school furniture, are erecting large dry kilns, a foundry and a machine shop at Ionia, Mich., equipment for which buildings has nearly all been purchased.



## The Iron and Metal Trades.

The latest advices from the leading distributing centers point rather to a slight weakening tendency in the Pig Iron markets. Some of the Southern makers, seeing business going almost entirely to Northern producers, are shading prices. Complaints are coming from some foundries that business is slow with them, and they naturally hesitate about additional purchases. Still, the tonnage, almost entirely for the first quarter, is fair.

A number of the leading Southern interests continue to work on a plan to harmonize the recent differences and to reach some common ground for prices. Some interest in the movement has been taken by high officials of the United States Steel Corporation, but the inferences drawn therefrom that the Corporation is seeking control are ridiculous. The officials in question are personally interested in one of the Southern companies, and have participated in conferences merely in their private capacity.

In the East there has been a little more demand for Basic and Low Phosphorus Pig from the Steel works, whose business has improved somewhat. The latter has sold at \$18 and \$18.50 for round lots.

There has been some inquiry for foreign Ferromanganese, which has sold lately at \$42 and \$42.50, delivered.

The deadlock in the Steel Rail trade continues, but it looks as though the logic of the situation will force the makers to give way. The mills which reroll Old Steel Rails into Light Sections, a special group of small mills, have come together, and have fixed new prices. The large works, who roll new Light Rails, do not seem to be a party to this understanding, and are still selling considerably below the prices named, although the lowest figures made some time since have been withdrawn.

There is a little better feeling in the Bar trade East and West, but the Sheet trade still shows symptoms of weakness. The tonnage in Plates and Shapes is better, but while pool prices on these materials are firm, those works have an advantage which manufacture bridges and buildings from the stuff made in their own rolling mills. They are making low bids on contracts for bridges and buildings. The result is that the views of the consumer are really being met and their interest is being stimulated. Thus the successful bid on the Cambridge Bridge, calling for 7200 tons of Structural Material, was taken at a low price by a company owning steel plant, rolling mill and bridge shops.

The demand for Wire products is very heavy under the stimulus of the recent slight advance.

The Scrap markets have been quite excited, and the claim is made that in a number of instances prominent dealers have been forced to cover short sales.

Advices from abroad are to the effect that the German Steel makers are making very low prices for Steel in the international markets, naming 75 shillings for Sheet and Tin Plate Bars, which would be equal to 73 shillings for Billets. Our American makers do not appear to be meeting these prices, which would be equivalent to about \$14.50 for Billets at Pittsburgh. As a matter of fact, the leading interest has been declining business offered for delivery during the next few months.

## A Comparison of Prices.

### Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 20, 1904.	Jan. 13, 1904.	Dec. 23, 1903.	Jan. 21, 1903.
<b>PIG IRON:</b>				
Foundry Pig No. 2, Standard, Philadelphia .....	\$11.75	\$14.75	\$15.00	\$22.25
Foundry Pig No. 2, Southern, Cincinnati .....	12.50	12.50	12.00	21.75
Foundry Pig No. 2, Local, Chicago .....	11.00	14.00	14.50	23.00
Bessemer Pig, Pittsburgh .....	13.85	13.85	14.10	21.85
Gray Forge, Pittsburgh .....	12.75	12.75	13.00	20.50
Lake Superior Charcoal, Chicago .....	16.75	16.75	16.50	26.50

### BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh .....	23.00	23.00	23.00	29.50
Steel Billets, Philadelphia .....	24.50	24.25	24.25	26.50
Steel Billets, Chicago .....	24.00	24.00	24.00	30.00
Wire Rods, Pittsburgh .....	30.00	30.00	30.00	34.50
Steel Rails, Heavy, Eastern Mill .....	28.00	28.00	28.00	28.00

### OLD MATERIAL:

O. Steel Rails, Chicago .....	10.00	10.00	9.00	18.50
O. Steel Rails, Philadelphia .....	12.00	11.50	11.50	20.75
O. Iron Rails, Chicago .....	15.00	13.00	13.00	24.00
O. Iron Rails, Philadelphia .....	16.00	16.00	14.50	23.50
O. Car Wheels, Chicago .....	13.50	13.00	13.00	24.00
O. Car Wheels, Philadelphia .....	13.00	12.75	12.75	20.50
Heavy Steel Scrap, Pittsburgh .....	13.50	12.50	11.00	21.00
Heavy Steel Scrap, Chicago .....	10.00	10.00	9.00	18.00

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia .....	1.35	1.35	1.35	1.93½
Common Iron Bars, Chicago .....	1.40	1.32½	1.30	1.81½
Common Iron Bars, Pittsburgh .....	1.29½	1.34½	1.34½	1.70
Steel Bars, Tidewater .....	1.44½	1.44½	1.44½	1.75
Steel Bars, Pittsburgh .....	1.30	1.30	1.30	1.60
Tank Plates, Tidewater .....	1.74½	1.74½	1.78	2.10
Tank Plates, Pittsburgh .....	1.60	1.60	1.60	1.75
Beams, Tidewater .....	1.74½	1.74½	1.73½	1.75
Beams, Pittsburgh .....	1.60	1.60	1.60	1.60
Angles, Tidewater .....	1.74½	1.74½	1.73½	1.75
Angles, Pittsburgh .....	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh .....	1.50	1.50	1.50	1.90
Skelp, Sheared Iron, Pittsburgh .....	1.50	1.50	1.50	1.95
Sheets, No. 27, Pittsburgh .....	2.29	2.20	2.25	2.65
Barb Wire, f.o.b. Pittsburgh .....	2.50	2.50	2.45	2.50
Wire Nails, f.o.b. Pittsburgh .....	1.90	1.90	1.85	1.90
Cut Nails, f.o.b. Pittsburgh .....	1.70	1.70	1.90	2.10

### METALS:

Copper, New York .....	12.75	12.75	12.37½	12.15
Spelter, St. Louis .....	4.70	4.70	4.65	4.80
Lead, New York .....	4.45	4.45	4.25	4.10
Lead, St. Louis .....	4.40	4.20	4.17½	3.97½
Tin, New York .....	28.50	29.25	28.50	28.00
Antimony, Hallett, New York .....	6.50	6.50	6.25	7.00
Nickel, New York .....	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York .....	3.79	3.79	3.79	3.79

## Chicago.

FISHER BUILDING, JANUARY 20, 1904.—(By Telegraph.)

A somewhat better feeling prevails in every branch of the Iron and Steel market, except in Southern Pig Iron, which is weaker than indicated by our last report, with every probability that Southern furnaces will have to recede from their \$10 price. Bar Iron has been advanced from 1.32c. last week to 1.40c. this week, and even at this price many Bar Iron mills are out of the market owing to the increased cost of their raw materials. Both Iron and Steel Bars are active, with a rumored advance in Steel of \$1 per ton, an advance that is favored by independent makers and will take place in case the United States Steel Corporation so wills. Structurals are more active than they have been for several months, with orders and inquiries coming in at a good rate for both small and medium sized tonnages. The Rail market is waking up in response to a multitude of small inquiries and some large ones. Plates are rather quiet in this particular market, as buyers laid in heavy stocks during the two weeks preceding the advance in delivered price on January 1. Merchant Steel shares in the general betterment, implement makers specifying more liberally than for two or three months. Sheets are still weak in price, although the demand is better than it has been for a long time. Old Materials are advancing spasmodically, and it is extremely difficult to give quotations that accurately represent the market.

**Pig Iron.**—By this time it has become clear to the interests involved in selling Pig Iron in this market that it is out of the question to induce the trade to buy in any quantity on the basis of \$13.85 for No. 2 Southern. It is

true that most of the interests are still asking this price, and it is also true that sales are being made at \$13.60, Chicago. This cut of 25c. was made in the first place by furnaces that were 25c. lower in freight distance from Birmingham to Chicago, and was afterward met by Birmingham producers. Even should all Southern producers come down to \$13.60, Chicago, it is not expected that any very great activity will result as long as Northern Iron is selling at \$14 for No. 2 Foundry. The whole trouble with the Pig Iron market must be sought for deeper down than the mere matter of price. The fact seems to be that foundrymen have a deplorable scarcity of orders on their books. Two leading reasons are given for this fact, first being that the users of Castings largely overbought in the first half of 1903 during the feverish times when the buying trade forgot all consideration of price in the intense effort to secure deliveries. As is usually the case when a shortage is evident, buyers exceeded their actual needs in those feverish times, and are now using up the surplus stocks. Implement manufacturers bought more Castings and made more machines than their trade demanded, and large quantities of these also have been carried over. Railroads are still limiting their buying to their actual necessities. Steel buildings and bridges, which call for an immense tonnage of Castings, are not being ordered in anything like the tonnage that they were a year ago. What buying there is done now in Foundry Irons is largely from Northern furnaces and not a very great volume of that. The tendency to refuse orders for the second quarter is not nearly so strong as it was a week ago, and Iron merchants are now expressing regret that they did not permit buyers to cover themselves for the second as well as for the first quarter during the little flurry in the first week in the year. We quote:

Lake Superior Charcoal.....	\$16.75 to \$17.00
Northern Coke Foundry, No. 1.....	14.50 to 14.75
Northern Coke Foundry, No. 2.....	14.00 to 14.25
Northern Coke Foundry, No. 3.....	13.50 to 13.75
Northern Scotch, No. 1.....	15.00 to 15.25
Ohio Strong Softeners, No. 1.....	16.30 to 16.55
Ohio Strong Softeners, No. 2.....	15.80 to 16.05
Southern Silvery, according to Silicon.....	15.35 to 16.35
Southern Coke, No. 1.....	14.10 to 14.35
Southern Coke, No. 2.....	13.60 to 13.85
Southern Coke, No. 3.....	13.10 to 13.35
Southern Coke, No. 4.....	12.60 to 12.85
Southern Coke, No. 1 Soft.....	14.10 to 14.35
Southern Coke, No. 2 Soft.....	13.60 to 13.85
Foundry Forge.....	12.60 to 12.85
Southern Gray Forge.....	12.35 to 12.60
Southern Mottled.....	12.10 to 12.35
Alabama and Georgia Car Wheel.....	to 19.85
Malleable Bessemer.....	14.50 to 15.00
Standard Bessemer.....	16.30 to 16.80
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon.....	17.30 to 18.80
Basic Southern.....	14.35 to 14.85

**Bars.**—The Bar Iron situation is unusually interesting just now. In the first place, prices have been advanced to 1.40c., base, half extras, Chicago, instead of 1.32c., our lowest quotation of last week. And as far as discoverable, the new price is being maintained by all interests for current business, with some mills holding out for 1.45c. for single car lots. Even at this price mills are averse to booking orders for any but nearby delivery. A 1000-ton lot of Iron Bars was bought yesterday by a local jobber. The following are the mills that are still actively in evidence on Common Iron Bars in this market: Republic Iron & Steel Company, Ft. Wayne Iron & Steel Company, National Rolling Mill Company, Ohio Falls Iron Company and the Highland Iron & Steel Company. Mills that have been withdrawn from the Bar Iron market are: American Rolling Mill Company plant at Muncie, closed down indefinitely; Emlen Iron Works plant at East Chicago, Ind., will be closed shortly pending a reorganization of the company; whether this will occupy one month or six cannot now be predicted; Eagle Horseshoe Company, at South Milwaukee, Bar mill shut down indefinitely unless prices advance materially. We omit mention of firms in Cleveland and further East, because the freight rate to Chicago throws them out of competition in this market on Iron Bars. The present attitude of holders of Scrap has much to do with the difficulty confronting Iron Bar producers, because it is impossible for them to buy Iron Scrap at the prices quoted in current market reports, as dealers will not sell in any quantities at such prices. In Steel Bars the four leading producers report an excellent business, both in the nature of new contracts and in specifications against existing contracts. It is now the talk that Steel Bars will be boosted \$1 a ton inside of the next ten days, although no definite steps have been taken in this direction. Business in Steel Hoops has remained good, as compared with Bars, even through the lean weeks that have just passed. We quote: Iron Bars, 1.40c. to 1.45c., base, half extras; Steel Bars and Bands, 1.46½c., base, half extras; Steel Hoops, 1.81½c. rates, full extras. All the above prices are for car-load lots, Chicago, and are subject to an advance of 5¢. to 10c. per 100 lbs. for less than car lots, with the regular extras for less than a ton of a size. Store business is still improving, with 1.65c. to 1.70c., base, half extras, for Steel Bars the average quotations, the price of 1.60c. being only quoted to large regular buyers in round lots from store when necessary to meet competition. Iron Bars from store are

being offered at the same price as Steel, with full card extras in place of half extras. Hoops from store are offered at 2.10c. to 2.20c. rates, full extras.

**Structural Material.**—The three leading producers report greater activity in Structural than they have felt for some months. While Structural Steel is nominally \$6 per ton higher than Steel Bars, there is actually only a small difference between the two products in the building or bridge, as Structural are sold at a flat price per ton inside of wide limitations, as against the long list of extras for size charged for Steel Bars. When one considers also the great concessions that are being made by Structural Iron workers and Structural mills on cutting, punching, assembling, coping, riveting and bending he will find that Steel buildings can be erected more cheaply now, as far as the cost of the metal is concerned, than for several years. We quote: I-Beams and Channels up to and including 15 inches and Angles 3 inches on one leg and larger, 1.76½c., Chicago: Tees, \$1 per ton extra. Structural are finding rather better sale from store than for some weeks, and sales are being made at 1.95c. to 2c. cut to lengths 5 feet and over, with here and there sales made at 1.90c. to large buyers.

**Plates.**—Business is quieter than in other Finished Steel products, owing partly to the fact that buyers anticipated their wants just before the new advanced delivered price went into effect January 1, and partly to the repeated reductions in prices of Sheets and the disparity between prices of Plates and Bars. We quote: Tank Steel, ¼-inch and heavier, 1.76½c. to 1.86½c.; Flange, 1.86½c. to 1.96½c.; Marine, 1.96½c. to 2.06½c.; Universal Mill Plates, 1.76½c. to 1.86½c. From store Plates are selling at 2c. for Tank quality, ¼-inch and heavier; 2.10c. for 3-16; 2.15c. for No. 8; 2.20c. for No. 10, with 25c. per 100 lbs. for Flange quality.

**Sheets.**—Sheets are ruling lower in price than last week, although there is reported to be a better buying movement than there was a week ago. In the prices that follow the intervals between the various gauges are not adhered to uniformly, though the general result gives a fair average of the quotations being made in car lots, f.o.b. Chicago: No. 10, 1.81½c. to 1.86½c.; No. 12, 1.91½c. to 1.96½c.; No. 14, 1.96½c. to 2.01½c.; No. 16, 2.11½c. to 2.16½c.; Nos. 18 and 20, 2.21½c. to 2.26½c.; Nos. 22 and 24, 2.26½c. to 2.31½c.; No. 26, 2.31½c. to 2.36½c.; No. 27, 2.36½c. to 2.41½c.; No. 28, 2.46½c. to 2.51½c.; No. 29, 2.61½c. to 2.66½c.; No. 30, 2.71½c. to 2.76½c. The largest local mills might shade these prices at least 1½c. on desirable business. We quote as follows from local warehouses: Nos. 8 and 10, 2.15c.; No. 12, 2.20c.; No. 14, 2.30c.; No. 16, 2.40c.; Nos. 18 and 20, 2.50c. to 2.55c.; Nos. 22 and 24, 2.60c. to 2.65c.; No. 26, 2.70c. to 2.75c.; No. 27, 2.80c. to 2.85c.; No. 28, 2.85c. to 2.90c. Galvanized Sheets are a little firmer in tone, with 80 and 5, Pittsburgh, made only in exceptional cases, 80 and 2½, Pittsburgh, being the ordinary price to the single car lot buyer.

**Billets.**—There is but little to report on this material. The jobbing forge shop is paying \$24, Chicago, for its Open Hearth Forging Billets, the pool price. Just what concessions from pool prices could be secured by large buyers for Rolling Billets on a trading off or conversion arrangement involving the sale of Pig Iron or Scrap to the Steel mill it is impossible to say. It is reported that the International Harvester Company bought 2000 tons of Billets recently, but the price is not disclosed.

**Rails and Track Supplies.**—A better feeling pervades the market on Light Rails, and the inactivity of last week is giving way to a fair buying movement at prices ranging from \$25 to \$27 per gross ton, according to weight of Rail and importance of buyer. Standard Sections are, of course, quoted at the association price of \$28 per gross ton, f.o.b. maker's mill. No large tonnages of Standard Sections have been placed recently, though inquiries aggregating a large tonnage for these times are said to be in evidence. We make no change in quotations on Track Supplies, which rule about as follows: Angle Bars, 1.40c. to 1.50c.; Spikes, 1.80c. to 1.90c., base; Track Bolts, 2.50c. to 2.60c., base, with Square Nuts, and 10c. to 15c. advance for Hexagon Nuts.

**Merchant Steel.**—The two leading factors in this market report trade as being better than it has been for some months, specifications coming in in unexpected numbers and volume, and a number of new contracts being placed at current prices. There is a feeling that some lines of Merchant Steel may be advanced, notably the ones that were reduced in prices at the time of the deep cut in Bar Steel. But thus far these are only rumors, and, emanating from the mill men as they do, may be taken as an indication of the wish being father to the thought. Prices remain unchanged, as follows: Open Hearth Spring Steel to the general trade, 2c. to 2.25c.; Smooth Finished Machinery Steel, 1.71½c. to 1.81½c.; Smooth Finished Tire, 1.66½c. to 1.76½c.; Sleigh Shoe, 1.51½c. to 1.61½c.; Cutter Shoe, 2.25c. to 2.35c.; Toe Calk Steel, 2.01½c. to 2.11½c.; Crucible Tool Steel, 6½c. to 8c.; Special Tool Steel, 12c. up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots.



**Merchant Pipe.**—Renewed activity is noted in the sale of Merchant Pipe, both from mill and from store. It is understood that the independent mills are sticking pretty close to the prices made by the leading producer, as quoted below. There is a feeling in the market that while the prices may not go higher for some time, they are not likely soon to be lower than they now are, and this feeling has restored confidence and stimulated buying, not only for immediate daily needs, but for a little time ahead. The quotations of the leading producer are on the basis of the following discounts in carload lots, Chicago:

	Steel Pipe— Black.	Galv. Black.	Galv. Wrought Iron— Black.	Galv. Black.
	Per cent.	Per cent.	Per cent.	Per cent.
1/2 to 3/4 inch.....	68.35	58.35	65.35	55.35
1/2 inch.....	71.35	61.35	68.35	58.35
3/4 to 6 inches.....	75.35	65.35	72.35	62.35
7 to 12 inches.....	69.35	59.35	66.35	56.35
Less than carloads, 12 1/2 per cent. advance.				

**Boiler Tubes.**—Both mill representatives and warehousemen report that business in Boiler Tubes is all that they could expect, everything considered. The gradual restoration of confidence in manufacturing circles in the West and the extensions being undertaken by electric railways have led to the placing of a large number of orders and a consequent better feeling in the Boiler Tube market. The leading producer quotes the following discounts in carload lots from mill, f.o.b. Chicago:

	Steel.	Iron.	Seamless steel.
1 to 1 1/2 inches.....	42.35	38.85	53.35
1 1/2 to 2 1/2 inches.....	54.85	37.35	40.35
2 1/2 inches.....	57.45	42.35	up to 4 in.
2 1/2 to 5 inches.....	63.35	49.85	48.35
6 to 13 inches.....	54.85	37.35	....

Warehousemen have made no change in their discounts, which remain as follows:

	Steel.	Iron.	Seamless steel.
1 to 1 1/2 inches.....	40	35	37 1/2
1 1/2 to 2 1/2 inches.....	50	32 1/2	35
2 1/2 to 5 inches.....	60	45	45
6 inches and larger.....	50	32 1/2	..

**Cast Iron Pipe.**—This market is seasonably quiet, with no changes in prices quoted for ordinary lots. We quote: 4-inch Water Pipe, \$27 per gross ton, and 6-inch Water Pipe \$26, with Gas Pipe \$1 per net ton higher than the gross ton price of Water Pipe. On large inquiries there is no doubt that \$25 for 6-inch could easily be obtained.

**Old Material.**—Ask any of the leading dealers in Old Material the market price on a given line, and he will say: "I should say the market price is about so and so," but will quickly follow the statement with, "but we won't sell at that price." In other words, there is a deadlock between buyer and seller, the difference ranging from \$1 to \$3, according to the material quoted on and the attitude of the dealer. It is doubtless true that many large dealers have bought heavily in the cheap markets of the last two months, adding their purchases to the high priced materials bought in the boom times of 1903, and their endeavor is to hold out all these stocks until a sufficient advance in price has been secured to show a profit on their old and new purchases. Railroads are not pushing their Scrap on the market with the regularity that usually characterizes them, and we have before us the anomalous position of a scarcity of available material coupled with a low price. Advances are noted in the following lines, of which the \$2 per ton added to last week's quotations on Old Iron Rails is the most noteworthy: Old Iron Rails, Old Steel Rails, 4 feet and over; Old Car Wheels, Iron Fish Plates, No. 1 Railroad Wrought, No. 1 Busheling and Wrought Pipe. We quote as follows per gross ton, Chicago:

Old Iron Rails.....	\$15.00 to \$16.00
Old Steel Rails, 4 feet and over.....	12.00 to 12.50
Old Steel Rails, less than 4 feet.....	10.00 to 10.50
Heavy Relaying Rails, subject to inspection.....	23.00 to 24.00
Heavy Relaying Rails, for side tracks.....	18.00 to 20.00
Old Car Wheels.....	13.55 to 14.00
Heavy Melting Steel Scrap.....	10.00 to 10.50
Mixed Steel.....	8.00 to 9.00
Mixed Country Steel.....	8.00 to 8.50

The following quotations are per net ton:

Iron Fish Plates.....	\$12.50 to \$13.00
Iron Car Axles.....	15.25 to 16.00
Steel Car Axles.....	9.00 to 9.50
No. 1 Railroad Wrought.....	11.00 to 11.50
No. 2 Railroad Wrought.....	9.00 to 9.50
Shafting.....	13.00 to 13.50
No. 1 Dealers' Forge.....	9.00 to 9.50
No. 1 Busheling and Wrought Pipe.....	8.50 to 9.00
Iron Axle Turnings.....	8.00 to 8.50
Soft Steel Axle Turnings.....	8.00 to 8.50
Machine Shop Turnings.....	7.25 to 7.50
Cast Borings.....	4.00 to 4.50
Mixed Borings, &c.....	4.00 to 4.50
No. 1 Boilers, cut.....	8.50 to 9.00
Heavy Cast Scrap.....	10.50 to 11.50
Stove Plate and Light Cast Scrap.....	9.00 to 9.50
Railroad Malleable.....	8.00 to 8.50
Agricultural Malleable.....	7.50 to 8.00

**Metals.**—Pig Lead shows continued strength, as high as 4.40c. per lb. being offered in 50-ton lots for prompt delivery. Lead is scarce and hard to get. Car lots would be quoted

at about 4.45c. and less than car lots at about 4.50c. Pig Tin shows a slight weakening in price, being quoted at 29 1/4c. per lb. in car lots and 29 3/4c. in less than car lots. Casting Copper is being quoted at 13 1/4c. to 13 3/4c., with Lake 1/4c. higher. Spelter continues to be quoted at 4.85c. in car lots and 5.10c. in less than car lots. Sheet Zinc is still offered at 5.65c. per lb. in car lots of 600-lb. casks, with 20c. advance for less than car lots. Old Metals are strong, with Copper, Brass and Lead higher. We quote: Copper Wire and Heavy, 11 1/4c.; Copper Bottoms, 10 1/2c.; Copper Clips, 10 1/4c.; Red Brass, 10 1/2c.; Red Brass Borings, 9 1/2c.; Yellow Brass, heavy, 8 1/2c.; Yellow Brass Borings, 6 1/2c.; Light Brass, 6c.; Heavy Lead, 4.25c.; Tea Lead, 3.85c.; Zinc, 3 3/4c.; Block Tin Pipe, 24c.; Pewter, No. 1, 19c.

**Tin Plate.**—Business continues to be good, as compared with that of November and December, in Tin Plate, on the basis of \$3.60 per box, Pittsburgh, or \$3.79 per box, Chicago, in car lots.

**Coke.**—Connellsville 72-hour Foundry Coke is now being sold as low as \$4.65, Chicago, which would be \$2 at the ovens, and prices range from there up to \$4.80 and \$5. Though low compared with former prices, these figures are not thought to be lower than Coke should sell in terms of the present low cost of Iron. Only a moderate volume of Coke is moving, and melters are disposed to look for weakness rather than strength in this market in the next month or two. The railroads are making more prompt deliveries on Coke than is customary with them at this season of the year.

B. M. Gardner has opened an office at 541 The Rookery, Chicago, to handle Iron and Steel products. He has secured the agencies in Chicago territory of the Northern Engineering Works of Detroit, Mich., makers of Cranes, Hoists and Foundry Equipment; the National Elastic Nut Company of Milwaukee, Wis., and the Wallace Machine & Foundry Company of Lafayette, Ind. Mr. Gardner will also handle Light Rails, Cars and other mine supplies, Billets, Rods, Sheets, Bar Iron and Steel, Steel Castings, Machine Bolts and Rivets.

## Philadelphia.

PHILADELPHIA, PA., January 19, 1904.

Very conflicting reports are around in regard to the condition of the Iron and Steel trades, but most of them have been upset by the furnace report which was published last week. If talk would make things go, we should have had the wildest kind of a bull market; but the facts are against any developments of that kind. What little improvement there has been transferred to Old Material, and in some degree to finished products, but Pig Iron is distinctly easier and extremely quiet. There is nothing to indicate any radical change, however, but the most that can be said is that the trade hope that things will be better, and in spots they are a trifle better, although in others evidences of less favorable conditions are not wanting. The demand for Pig Iron has fallen off considerably, and while there is no pressure to sell at reduced prices, the turn is surely in the buyer's favor. How far this will go or how long it will continue, is a matter of uncertainty. Northern Irons cannot be sold for less than current rates on the present basis of costs, and, with half the productive capacity idle, it is not to be supposed that any advance is possible unless there is a very big increase in consumption; while, as a matter of fact, the demand has fallen off considerably. The increased demand for Old Material and the slightly better demand for mill products are favorable features, but these may be temporary conditions, in which case the market will soon show it. There has been a long period of dullness, and it will be strange indeed if there is not some improvement; but as yet it is not of any great importance. There is a little more doing at the car and locomotive shops, and, in fact, all lines are doing a little better; but with such a complete exhaustion of work at the mills, it requires a lot of business to furnish anything like all around activity. The financial situation is improving, and if prices can be adjusted so as to inspire confidence in values there would be a fair chance for considerable activity during the spring and summer months. But there are inequalities which will have to be corrected before there is much activity, and until that is accomplished a great deal of business will be held in abeyance.

**Pig Iron.**—The market is not as active as it was three or four weeks ago, but prices are fairly maintained. The idea that they can be advanced is pretty well dissipated for the present, and if business can be had at inside figures, sellers are disposed to accept all that is offered. There are two sides to the market, however, one being that production has been decreased nearly 50 per cent.; but against that stocks have attained formidable proportions, being nearly seven times what they were a year ago. Under such conditions it is impossible to say what the immediate outcome will be, except that higher prices are extremely probable.

The Iron on hand cost more than present prices will return, and it is a problem whether to limit production until stocks are worked down or to enter the market in competition with Southern and other Irons. In case the last named policy is adopted, it is safe to assume that prices will be lower, but if a mutual agreement can be made to continue the restriction of output, prices may perhaps be maintained. The difficulty is that all the furnaces are not situated alike, and if those who can get out whole decide to take their full share of the business it will be bad for those that are less favorably situated. There can be no doubt that this covers the situation at the present time, and the chances are strong that the fittest will survive. The attempt to continue the movement in Southern Iron on the basis of \$14 for No. 2 X, delivered, has been pretty well abandoned, and while prices are nominally unchanged, evidences are not few that better can be done of first-class orders. But for the present there is very little demand, so that prices are more or less nominal, as follows, for Philadelphia and nearby points:

No. 1 X Foundry.....	\$15.50 to \$16.00
No. 2 X Foundry.....	14.75 to 15.25
No. 2 Plain.....	14.25 to 14.50
Southern No. 2, rail shipment.....	13.75 to 14.00
Southern No. 2, on dock.....	13.00 to 13.50
Standard Gray Forge.....	13.50 to 14.00
Ordinary Gray Forge.....	12.75 to 13.25
Basic.....	13.85 to 14.00

**Steel.**—In small lots there is a very good demand, and quite a nice business is being done on the basis of \$24.50 to \$25, delivered, for local Steel.

**Plates.**—More business has been taken in than for several weeks past, but the tonnage is mostly in small lots, although the aggregate is enough to give the mills a moderately fair start. The feeling is hopeful and prospects are somewhat better than they were a few weeks ago, but there is nothing to indicate any radical change in the situation. The orders for material for the battle ships will be an important aid to some of the mills, but it will take considerable time before deliveries are called for. Some slight changes in prices will be noted, which are as follows for Philadelphia and nearby points:

	Carloads.	Part Carloads.
	Cents.	Cents.
Tank Steel, ¼ inch and heavier.....	1.73½	1.78½
Tank Steel, 3-16 inch.....	1.83½	1.88½
Tank Steel, Nos. 7 and 8, B. W. G.....	1.88½	1.93½
Tank Steel, Nos. 9 and 10, B. W. G.....	1.98½	2.03½
Flange or Boiler Steel.....	1.83½	1.88½
Commercial Fire Box Steel.....	1.93½	1.98½
Still Bottom Steel.....	2.03½	2.08½
Locomotive Fire Box Steel.....	2.23½	2.28½
Plates over 100 to 110 inches.....	.05 per lb. extra.	
Plates over 110 to 115 inches.....	.10	
Plates over 115 to 120 inches.....	.15	
Plates over 120 to 125 inches.....	.25	
Plates over 125 to 130 inches.....	.50	
Plates over 130 inches.....	1.00	
All sketches (excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches).....	.10	
Complete Circles.....	.20	
Shell grade of steel abandoned.		

**Structural Material.**—Following the Plate trade, there is a better feeling and the distribution of business has been larger than for some time past. Orders can be promptly filled, however, at unchanged prices—viz.: 1.73½c. to 1.85c. for Beams, Channels and Angles, according to specifications; small Angles, 1.45c. to 1.50c.

**Bars.**—There is a better tone to the Bar Iron market and first-class qualities are held at 1.35c. to 1.40c., delivered. Bars can be bought at 1.25c. to 1.30c., however, but the assortment of sizes is limited, so that buyers expect a corresponding reduction in prices. Steel Bars in fair demand at 1.43½c. to 1.50c., according to specifications.

**Sheets.**—There is a very good demand for Sheets, and local mills have now some very nice orders on their books. Prices are a little irregular, but best Sheets command full prices.

**Old Material.**—The extremely bad weather has been of great advantage to those who could make immediate shipments. Prices average from 50c. to \$1.50 per ton higher than last week's quotations. Bids and offers are about as follows for deliveries in buyers' yards:

Old Steel Rails.....	\$12.00 to \$12.75
Heavy Steel Scrap.....	11.75 to 12.50
Low Phosphorus Scrap, nominal.....	15.00 to 17.00
Old Steel Axles.....	14.00 to 15.00
Old Iron Rails.....	16.00 to 16.50
Old Iron Axles.....	15.50 to 16.00
Old Car Wheels.....	13.00 to 13.50
Choice Scrap, R. R. No. 1 Wrought.....	15.50 to 16.50
Country Scrap.....	13.50 to 14.50
Machinery Scrap.....	12.75 to 13.25
No. 2 Light Scrap.....	11.00 to 11.50
No. 2 Light (Ordinary).....	9.00 to 9.50
Wrought Turnings.....	9.00 to 9.50
Wrought Turnings, Choice Heavy.....	10.00 to 10.50
Cast Borings.....	6.50 to 6.75
Stove Plate.....	10.50 to 11.00
Wrought Iron Pipe.....	10.50 to 11.50

## Birmingham.

BIRMINGHAM, ALA., January 18, 1904.

The Iron market the past week showed no signs of an easing up. On the contrary, it gave every evidence of an increased firmness. The fact was emphasized that the \$10 basis for No. 2 Foundry was the accepted base price on all transactions, and there was very little opposition to that figure on the part of buyers. In confirmation of this statement is the fact that the market was entirely free of mutual charges involving concession in prices. If any concessions were made they were kept very quiet. The buying markets, from which such reports generally emanate, had nothing to complain of the past week on this score. All the sellers talked very positively of their maintenance of prices and their unanimity of statement upon this point carries conviction as to its correctness.

The largest order reported was one for 3000 tons on the basis of \$10 for No. 2 Foundry, in which No. 4 Foundry rated at \$9.25. There was another order for 1500 tons that was filled on the basis of \$10 for No. 2 Foundry, and there were orders for lots of 1000 tons, and from that quantity down to 100-ton lots. While there was no individual order of magnitude greater than reported above, the aggregate was very gratifying. They strengthened the growing feeling of confidence in the future of the market. Some orders were accepted for delivery in the second quarter, but they were cases where the delivery of the major part of the order covered the first quarter, and the first month of the second quarter was included to round out the order. There were no sales admitted where the entire order was for delivery the second quarter. Some prices were made for the second quarter, but they were on the basis of at least \$1 above current values. In some instances the price quoted was \$1.50 above current market. On the point of confining sales to delivery not longer than 90 days ahead the trade is of one accord, and there must be some temptation in price to induce a change of heart in this respect. It is interesting to note that the business being done is pretty generally distributed and is not confined to a limited section of the Iron field. One sale of Iron carrying 2 per cent. silicon was placed at \$9.50, while another lot carrying 2½ per cent. was placed at \$10. Basic Iron can be had now in moderate amounts at \$10.

Shipments continue very free, and it will be some time before there is any let up in this respect. The past month broke the record for shipments of Iron. The report of the Southern Iron Committee for the month of December shows that the movement of Pig Iron amounted to 173,026 tons, and of the amount 109,994 tons went from the Birmingham district. The amount exported was 3915 tons. The amount of shipments of Cast Iron Pipe was 8805 tons, of which only 180 tons was exported. The Steel Rails shipped amounted to 160 tons, while the Steel Billets shipped amounted to 765 tons. This is the banner record so far of shipments for any one month.

Turning now to the report of the Alabama Car Service Association, we find that it handled during the year 1903 a total of 733,816 cars, as against 613,937 for the preceding year, a difference of 117,879 cars in favor of 1903. At the rate we are now going this increase will be added to, and we will make another high water mark. March was the month of greatest activity and covered 67,400 cars, and July was the smallest month in activity and covered 51,202 cars.

The Steel mill is still making its preparations for the resumption of operations, and your correspondent has the information from official sources that about the 25th of the month it will fire up and start to work again. The Bessemer Rolling Mills, after a long period of idleness, started up again to-day, with orders sufficient to keep them going for some time to come. The Pipe Works continue to report business as very satisfactory, and say that in some instances they are unable, because of previous acceptances of business, to care for all that is being offered. There has been no advance in outside quotations, but the inside prices have been moved up toward the outside prices, and there is no disposition to concede values to secure orders. Quotations as given run from \$22 to \$23 for the heavy sizes, and for 6-inch and up to 16 and 18 inches they are \$24 to \$25. Of course, it must be understood that these prices are only approximate. Those in the business know that prices purely for information is one thing and values to secure business in sight is a horse of another color. Some export business to Porto Rico has been worked of late, but no great quantity.

Another meeting of the furnace interests was held the past week without coming to any other conclusion than that the fraternity was not a unit in agreeing to the object desired. The success of the move is dependent upon the unanimous acceptance of the plan. The meeting here adjourned with the understanding that another meeting would be held in New York the first half of this week, when the respective attorneys of the leading prominent interests will get together and try to smooth out the objections and formulate a plan that will be of acceptability to all concerned.



The persistency with which the idea or plan is being pursued is the best evidence of the importance attached to it by those most interested. To a disinterested observer it looks as if the first thing to do is to buy out those interests that are holding off, and thus create a homogeneous interest linked into one harmonious whole for one common object. It's a case where success depends upon a long pull, a strong pull and a pull altogether. Otherwise it's a case of holding an umbrella over the fellow who is on the outside and a beneficiary without being a member.

## St. Louis.

CHEMICAL BUILDING, January 20, 1904.—(By Telegraph.)

**Pig Iron.**—There have been days of late when the Pig Iron market showed quite some improvement in both the line of sales and inquiry, but it has again relapsed into comparative dullness. Iron is said to be coming more freely from the furnaces to this market, and in the event of sudden demand from consumers for quick shipment sales departments will be in position to give prompt service. Prices hold stiff, around \$10, Birmingham, for No. 2 Foundry grade. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$13.75 to \$14.00
Southern, No. 2 Foundry.....	13.25 to 13.50
Southern, No. 3 Foundry.....	12.75 to 13.00
Southern, No. 4 Foundry.....	12.25 to 12.50
No. 1 Soft.....	13.75 to 14.00
No. 2 Soft.....	13.25 to 13.50
Gray Forge.....	11.75 to 12.00
Southern Car Wheel.....	19.50 to 20.00

**Bars.**—It is remarked in jobbing circles that trade the past few days has been better, perhaps an improvement over what was looked forward to mark the opening weeks of the year. Prices are not established on a uniform basis, but a fair average is 1.65c. for Iron, and Soft Steel at 1.75c.

**Angles and Channels.**—The movement from jobbers' warehouses of this class of supplies has been somewhat better the past week. Prices unchanged at 2c., base, in lots from store.

**Pig Lead.**—On the advance in price, conditions have been of a firm and steady order. Recent sales of spot metal reported at 4.40c., with quotation in lots for future delivery slightly lower.

**Spelter.**—Recent sales at 4.70c., with market not very active, but holding steady and firm.

## Pittsburgh.

PARK BUILDING, January 20, 1904.—(By Telegraph.)

**Pig Iron.**—The market on Pig Iron remains quiet, and there is not much doing except on Foundry Iron, a number of sales of which have been made, mostly for early delivery. In view of the sharp advance in Scrap a better demand for Pig Iron is expected, as Heavy Melting Stock and Wrought Scrap are now bringing higher prices than Bessemer Iron. Northern No. 2 Foundry is held at \$13, Valley furnace, or \$13.85, Pittsburgh, but several round lots have been sold at \$12.75, Valley, or \$13.60, Pittsburgh. Southern furnaces are holding No. 2 at \$10, Birmingham, or \$14.35, Pittsburgh, but this price is prohibitory, as Northern Foundry Iron can be bought for less money. There is very little doing in Bessemer Iron, only an occasional small lot changing hands. It is held at \$13, Valley, or \$13.85, Pittsburgh. Gray Forge is quiet and is nominally \$12.75 to \$13, Pittsburgh, for Northern brands.

**Steel.**—The Steel market is very quiet, and any Billets or Sheet Bars changing hands are usually on a sliding scale basis, or else on other deals which make the prices somewhat below those fixed by the Billet pool. There are very few buyers of Billets or Sheet Bars in the open market, consumers that do not have their own Steel works being covered by sliding scale contracts.

**Hoops and Bands.**—We quote Steel Hoops at 1.65c. in carloads, extras as per Steel Hoop list, and Bands at 1.30c., extras as per Steel Bar cards. A meeting of the Cotton Tie mills will be held in a few days, when prices for this year will be adopted.

**Iron and Steel Scrap.**—The Scrap market is showing considerable activity, the demand being heavy, and some kinds of Scrap have advanced \$2 to \$3 a ton. As high as \$13.50 has been offered for Heavy Melting Stock in gross tons, and some dealers are holding for \$14. Piling Plate Scrap is held at \$15, net tons; No. 1 Wrought Scrap is held at \$14.50 to \$15 in net tons. Other kinds of Scrap have advanced in proportion.

(By Mail.)

The general situation in the Iron trade is undoubtedly better in the direction of inquiries, and demand is picking up on some lines of Finished Material. Mills making Wire and Wire Nails report a heavy business in these products, and it is the opinion that unless jobbers place orders very early this year there will be trouble in getting prompt deliveries in February and March. The demand for Plates, Sheets, Iron and Steel Bars and Pipe is better, and more tonnage is being placed than for some time. The whole market on Finished Iron and Steel shows improvement over December, the actual tonnage being larger. In Pig Iron and Steel trade is quiet, and prices on Pig Iron are not as firm as the furnaces would like to see them. Consumers are buying cautiously, usually limiting their purchases to January and February delivery. Bessemer Iron is quoted at \$13, Valley furnace, but on a firm offer this would be shaded. Northern brands of No. 2 Soft Foundry Iron are generally quoted at \$13, Valley, or \$13.85, Pittsburgh. In exceptional cases, however, and where a good deal of tonnage was involved, Northern No. 2 has sold as low as \$12.75, Valley. There is a little more inquiry for Gray Forge, and Northern brands are reasonably firm at \$12.75 to \$13, Pittsburgh. The output of Pig Iron in January will be considerably larger than in December, as a good many furnaces have started since January 1, and others will be blowing before this month is out. The shutdown movement inaugurated some time ago, largely by the Bessemer Furnace Association, has been of considerable benefit to the trade, as prices of Pig Iron would undoubtedly have been much lower had it not been that so many furnaces were blown out. The Coke trade is also showing signs of betterment, demand for Furnace Coke being more active than for some time, on account of a number of blast furnaces having blown in and which are now figuring on their requirements of Coke. While it is true that a large tonnage of Furnace Coke has sold as low as \$1.45 and \$1.50 a ton at oven, yet it is claimed that this was not strictly Connellsville, but was Coke made outside the Connellsville region, not being as high in quality as the latter.

**Steel Rails.**—It is understood that a good deal of foreign tonnage in Steel Rails is under negotiation. The New York Central is said to be figuring on its requirements for 1904 and may place a contract before long. Other roads are said to be in the market, and it is believed considerable tonnage in Rails will be placed soon. Some of the outside mills rolling Light Rails met here last week and fixed the price of 12 lb. at \$28 and 16 to 40 lb. at \$27, at mill.

**Muck Bar.**—We quote domestic makes of Muck Bar at \$24.50, Pittsburgh. There is very little doing.

**Sheets.**—The better inquiry for Sheets noted last week continues, a good deal of tonnage being under negotiation and some good sized contracts have already been placed. Demand for Sheets is expected to improve steadily from this time forward, and the mills believe they will have good business in the next three or four months at least. We quote Black Sheets, box annealed, one pass through cold rolls, as follows: Gauges 18 and 20, 2.05c. to 2.10c.; 22 and 24, 2.10c. to 2.15c.; 26, 2.15c. to 2.20c.; 27, 2.20c. and 2.25c.; 28, 2.30c. to 2.35c.; 29, 2.45c. to 2.50c.; 30, 2.55c. to 2.60c. These prices are for carloads and larger lots, f.o.b. maker's mill. Galvanized Sheets are quoted at 80 and 2½ per cent. off in carloads, but for very nice specifications it is possible that some mills might name 80 and 5 per cent. off.

**Plates.**—General demand for Plates is a little better, but is still very far short of being large enough to give the mills full work. An interesting feature of the Plate situation is that some of the Sheet mills are offering narrow widths of Plates at less than the association prices. The Steel car concerns are taking some orders for cars, and as a result the Plate mills anticipate getting some contracts for Plates from these concerns. The new 140-inch Plate mill of the Carnegie Steel Company at Homestead is expected to be ready for operation early in March. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches in width, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, \$2 extra; gauge Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

**Structural Material.**—No large jobs have recently been placed in this district, but the feeling is much better and several large contracts for new work are in sight. A good many small jobs are being placed and the outlook for the Structural trade this year is regarded as very bright. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

**Iron and Steel Bars.**—Tonnage in both Iron and Steel Bars has shown improvement since the first of the year, and the mills are entering more orders than during last month. The Steel Bar Association met in this city last week and reaffirmed the old price. There was some discussion as to the advisability of making a slight advance in price of Steel Bars, effective about February 1, and allow the trade to place orders in the meantime at the old price, but this was not adopted. We quote common Iron Bars for very nice specifications at 1.25c., and for ordinary specifications, 1.30c., at maker's mill. We quote Steel Bars at 1.30c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs. and not less than 1000 lbs. the price is 1.40c., and for less than 1000 lbs. the price is 1.50c.

**Merchant Steel.**—Tonnage is only fair, orders being mostly for small lots and actual need. Large interests decline to contract ahead, but are placing small orders from time to time. The leading interest is said to be quite short of work. We quote: Tire Steel, 1.50c., base, for usual sizes; Toe Calk, 1.85c., base; Sleigh Shoe Steel, 1.45c. to 1.50c.; Open Hearth Spring, 1.90c. to 2c.; Cutter Shoes, tapered and bent, 2.25c. The above prices are for carload lots at mill, the usual differentials being charged for small lots. Tool Steel is 6c. to 8c. for ordinary grades. Prices on Shafting are firm on the basis of 52 per cent. off in carloads and 47 per cent. in less than carloads, delivered in base territory.

**Ferromanganese.**—The market is very quiet, and domestic 80 per cent. Ferro is offered at \$45 to \$46 in large lots.

**Wire Rods.**—The market on Rods is firm, and Bessemer and Open Hearth are held at \$30, Pittsburgh. Chain Rods from special stock are held at about \$32, maker's mill.

**Spelter.**—Prime grades of Western Spelter are fairly firm at 4.75c. to 4.80c., Pittsburgh. Demand is light and very little Spelter is moving.

**Railroad Spikes.**—A somewhat better demand is reported, and we quote at \$1.80 to \$1.85 per 100 lbs., f.o.b. Pittsburgh.

**Skelp.**—Demand for Skelp has been very dull for some time and shows no sign of early improvement. Some of the Skelp mills have recently made material reductions in wages and are offering Skelp at slightly lower prices. We quote Sheared Iron Skelp at 1.45c. to 1.50c., Pittsburgh.

**Merchant Pipe.**—For this season of the year demand for Pipe is quite good, especially on 6-inch and larger, and the leading Pipe mills are fairly well filled up. Discounts to consumers in carloads, which in some cases are slightly shaded by some of the outside mills, are as follows:

	Steel.		Iron.	
	Black.	Galvd.	Black.	Galvd.
1/4, 1/2 and 3/4 inch.....	70	60	67	57
1/2 inch.....	73	63	70	60
3/4 to 6 inches.....	77	67	74	64
6 to 12 inches.....	71	61	68	58
Extra Strong, Plain Ends:				
1/2 to 8 inches.....	69	59	65	55
Double Extra Strong, Plain Ends:				
1/2 to 8 inches.....	61	51	57	47

**Boiler Tubes.**—Demand is fairly active for this season of the year, but in some cases official prices are being shaded by some of the outside mills. Discounts to consumers in carloads, which, however, are frequently shaded, are as follows:

	Steel.	Iron.
1 to 1 1/4 inches.....	42 1/2	39
1 1/4 to 2 1/4 inches.....	55 1/2	38
2 1/4 inches.....	58	43
2 1/2 to 5 inches.....	64 1/2	50 1/2
6 to 13 inches.....	55 1/2	38

**Coke.**—We can report a much better inquiry for Furnace Coke, due to the starting up of a number of blast furnaces in the Central West. A large number of Coke ovens have recently been fired up, and, in point of demand, the Coke trade is more active than for some time. While prices are a little firmer, they have not as yet shown an actual advance. Over 4000 ovens were started up last week and shipments increased about 1600 cars. The Frick Coke Company have fired up about 1500 ovens, the Hecla Coke Company nearly 400, the Washington Coal & Coke Company about 100, and other Coke interests have also started up a considerable number of ovens. Last week out of 22,986 ovens in the Connellsville region proper, 13,692 were active and 9294 idle, output having been 135,575 tons, against 93,846 tons the week previous. In the Lower Connellsville or Klondike region there are 5356 ovens, of which 3327 were active last week and 2029 idle. Output was about 37,000 tons. A good deal of Furnace Coke for shipment in first six months, and in one or two cases for shipment in first of this year, has been sold at \$1.45 to \$1.50 a ton at oven, but this is not regarded as genuine Connellsville Furnace Coke, which is held by the large operators at \$1.60 to \$1.65 a ton at oven. Genuine Connellsville Foundry Coke is held at \$2.15 to dealers and \$2.25 to \$2.40 to consumers. Outside brands of both Furnace and Foundry Coke can be bought at lower prices than the above.

On January 19 the Pittsburgh sales offices of the American Sheet & Tin Plate Company were removed from the Vandergrift Building to the thirteenth floor of the Frick Building, Pittsburgh. In the future the Pittsburgh sales offices of the company will be in charge of E. W. Pargny, second vice-president and manager of sales, Frick Building. James A. Smith, Jr., formerly Pittsburgh sales agent of the American Sheet Steel Company, will be one of Mr. Pargny's assistants.

## Cleveland.

CLEVELAND, OHIO, January 19, 1904.

**Iron Ore.**—The movement of Iron Ore from the lake docks is still rather slow. The stocks at the furnace piles have been ample in most instances, which, together with the fact that consumption is light, obviates the necessity of a heavy shipment now. The Ore Association has not acted on prices and there has been some talk of delaying the meeting still further, as there is little prospect of any need for new Ore until at least June 1, if not later. The general supposition is that prices will eventually be reduced.

**Pig Iron.**—The buying of Foundry Iron for immediate consumption has been a little better. The advance buying has hardly improved to any appreciable extent, and the situation seems to be but slightly stronger than it was. The Southern furnaces are removed from this market as any sort of a factor. That the buying of Northern Iron has improved but slightly is indicated by the statement of the status of the furnaces in the Valleys. It is shown that two idle stacks will be blown in during January, eight during February, 19 are uncertain when they will resume, and 72 are closed for an indefinite period. The demand has not increased to the point where piling Iron has stopped. There is a slightly improved inquiry for Bessemer, and once in a while a call comes in for Basic. The Coke situation is unchanged and delivery is easy. The supply is all that could be desired. Good Furnace Coke is obtainable at between \$1.25 and \$1.60 at the oven, while good 72-hour Foundry Coke is selling at \$2.25 to \$2.50 at the oven. High Sulphur Cokes are selling at prices named by the consumer, the minimum heard here having been \$1.90 at the oven. The Pig Iron prices are quoted f.o.b. cars, Cleveland:

Northern Coke, No. 1 Foundry.....	\$14.25 to \$14.75
Northern Coke, No. 2 Foundry.....	13.75 to 14.25
Northern Coke, No. 3 Foundry.....	13.25 to 13.75
Southern Coke, No. 1 Foundry.....	14.25 to 14.50
Southern Coke, No. 2 Foundry.....	13.75 to 14.00
Southern Coke, No. 1 Soft.....	14.25 to 14.50
Southern Coke, No. 2 Soft.....	13.75 to 14.00
Jackson County, 8 per cent. Silicon.....	17.45
Hanging Rock Charcoal, No. 1.....	23.45
Southern Charcoal, No. 1.....	20.00 to 20.50
Lake Superior Charcoal.....	18.00 to 18.50

**Finished Iron and Steel.**—The general tone of the market might now be said to be improved. This is particularly true in the Bar trade, where the buying has been of a better character than at any time for the past six months. Contract booking has been resumed to a certain extent, and specifications against former contracts have slightly improved. The buying of Bar Iron has been a little better, the market being firmer than it was, with the smaller mills not disposed to cut prices now to get business, but rather holding rigidly to the old basis of prices, since the price of Scrap is stiff. The market is represented by 1.30c., Youngstown, for Bar Iron, and 1.30c., Pittsburgh, for Bessemer, and 1.40c., Pittsburgh, for Open Hearth. The Sheet market has been lifted out of its state of stagnation by some better buying, which has included a demand for material for spot shipment and also for future delivery. Some of the smaller concerns are making quotations slightly irregular at times by cuts, which, however, are not general. In the main the following quotations apply: No. 27 Black Sheets out of stock, 2.50c.; No. 27, one pass cold rolled, in car lots at the mill, 2.35c.; No. 22 and lighter Galvanized Sheets, 75, 10 and 2 1/2 off list, while the heavier gauges are quoted 75 and 10 off list. For the first time in a long while it may be said that there is a radical improvement in the Structural Steel trade. The prospect of the opening of the building season has caused anticipatory buying. Specifications against old contracts have accompanied new contracts, and the market in general has been very much better than it was. Much of the talk about a reduction has been stopped. The market is represented by a quotation of 1.60c., Pittsburgh. There has even been a better demand for Plates. The price has not changed with the better tone to the market, only the rebellion against the continuation of the old prices seems to have disappeared to a certain extent. The market now is quoted at 1.60c., Pittsburgh. There has been but little of interest in the Rail trade except the talk of better conditions as far as the larger producers are concerned. The market for Light Rails had been rather soft with some of the smaller producers cutting prices. The stiffening of the price of raw materials changed that situation somewhat, with the result that the market took a brace, and the larger mills are getting more of the business. The situation in the Standard Rail trade has not changed.



this market affording but small amounts of business. The price holds at \$28, Pittsburgh, for Standard Rails. The Billet market has been firm, and sales have been made at the association price of \$23.50, Cleveland, regardless of the rumors of cuts by the independent concerns, which cannot be confirmed here.

**Old Material.**—The demand for Scrap has improved somewhat during the past few days, and prices have stiffened without any advance having been announced. The situation is much stronger, however. We continue to quote, all gross tons: Old Steel Rails, \$14 to \$15; Old Iron Rails, \$16; Old Car Wheels, \$13.50 to \$14; Railroad Malleable, \$12 to \$12.50; Cast Borings, \$5. All net tons: No. 1 Railroad Wrought, \$11.50 to \$12.50; No. 1 Busheling, \$10 to \$11; Wrought Turnings, \$6 to \$6.50; Iron Car Axles, \$17 to \$18; No. 1 Cast, \$10.50 to \$11.50; Stove Plate, \$9 to \$10.

## The Belgian Iron Market.

BRUSSELS, December 30, 1903.

Our metallurgical industry is in a very serious condition. Buyers have taken advantage to the fullest extent of the necessities of the works, and the latter have also been forced to struggle against those who supply raw materials like Coal, Coke, Old Materials, &c. The strength of fuel rests alone upon the resistance of the Coke syndicate and upon the understanding between the collieries who do not want to reduce their prices. The Coke syndicate, as the result of an understanding with the Rhenisch Westphalian syndicate at Bochum, have forced our blast furnaces to make contracts at the old price, 18 francs for the first six months of 1904. Consumers, in view of the weakness of the Pig Iron market, desired to contract only for the first quarter, but they were forced to yield under threats of having their supplies cut off altogether. The outlook for the Belgian metallurgical industry for 1904 is therefore far from being encouraging. Although 1903 was, taken as a whole, rather bad, our works at least were fairly well occupied, owing chiefly to the orders received from the United States. We cannot now count upon shipments to the United States for the coming year. Quite the contrary. We are threatened with an invasion of American products on the European market. And to this competition must be added that made by the German works, which has become extremely disquieting. As an example we may cite the recent letting of a contract for 20,000 tons for the Mecca Railway, which took place at Constantinople. The following bids were made: Pennsylvania Steel Company, Steelton, Pa., £4 11s. 6d.; Gutehoffnungshuette, Oberhausen, £4 11s. 7d.; John Cockerill, Seraing, £4 12s. 4d.; Rheinische Stahl Werke, Meiderich, £4 19s. 3d.; Krupp, Essen, £5 1s. 7d. The bid of the Pennsylvania Steel Company was accepted, being lower than that of the others. Until now we have not been able to accustom ourselves to the idea that the American competition was very dangerous, but in the presence of facts so eloquent we must yield to the evidence.

The United States have sold us round quantities of Blooms recently, but it has been observed that these products are not of American manufacture. They are Blooms purchased in Germany which could not be placed on the other side of the Atlantic, and which therefore have been forced upon the market in Belgium.

Our country, which depends almost solely upon export markets, opens its doors to all sellers. Therefore our German neighbors can enter freely, they themselves being protected by powerful tariffs. They are able to do this because they make a great deal of money on their home market, where they are sole masters, and then they sell to us without profit, or even at a loss, without having cause for complaint.

In their struggle for export orders against the redoubtable Germans and seriously threatened with an invasion of the American products, our ironmasters, exploited by the producers of raw materials, must face more and more the impossibility of getting the slightest profit on their work. Therefore they have resumed the study of the project of organizing a common sales agency which, while it has no power to modify the conditions of the world's markets, could at least suppress the fierce and useless competition which they make among one another.

An examination of the markets in detail shows that for Pig Iron there is a certain weakness. Although our furnaces, owing to the high price of Coke, maintain their asking values, offers are made to our rolling mills by the producers of the Longwy district in France. These prices are lower by 1 to 2.50 francs than those quoted by our home producers. The latter are 62 francs for No. 3 Luxemburg Foundry, 51 francs for Luxemburg mill Iron, 56 francs for Charleroi mill Iron, and 63 francs for Thomas Pig, delivered.

On December 30, out of 39 furnaces in Belgium, 34 were in blast and five were out. In the Charleroi district 12 were running out of 16, four of them making Mill Iron and eight Pig Iron for Steel purposes. In the Liege district

every one of the 17 furnaces was in operation on Pig Iron for Steel manufacture. All of the six furnaces in the Luxemburg district were in operation, four making Foundry Iron and two Mill Iron.

Steel is being offered by the works in German Lorraine and in the East of France at 86.50 francs for Ingots, 89 to 90 francs for Blooms, 95 francs for Billets and 102.50 francs for Slabs.

There is a fair degree of activity in Finished products for the home market, but the export market is very much depressed. The events which have troubled the Far East during this winter and which threaten a war in the Orient have adversely affected our relations with these countries. So far as India is concerned, although there have been a good many inquiries for the season, very few orders have been confirmed, which gives an idea in itself of the character and urgency of foreign competition.

Among the finished products which may be considered as having least depreciated during recent times we may cite Iron and Steel Bars. So far as Beams are concerned the sales have been very slow, our home market taking nothing at this dead season, while export orders have been generally placed in Germany. The result is that the mills rolling these products are manufacturing only for stock. Plates have been particularly depressed. The construction shops have delayed placing specifications even for export. It is only at extremely low prices that the works can succeed in getting work. Quotations are as follows:

	Home. Francs.	Export.						
		£	s.	d.	£	s.	d.	
Steel Beams.....	122.50	4	3	0	to	4	4	0
Steel Angles.....	130.00	5	0	0	to	.....		
Rails of 30 kilos and upward.....	115.00	4	3	0	to	4	4	0
Rails of 15 to 30 kilos.....	120.00	4	10	0	to	.....		
Rails below 15 kilos.....	130.00	4	15	0	to	4	16	0
Merchant Bars, No. 2.....	130.00	4	17	0	to	4	18	0
Merchant Bars, No. 3.....	135.00	5	1	0	to	5	2	0
Steel Bars.....	132.50	4	18	0	to	4	19	0
Iron Plates, ½-inch and upward.....	140.00	5	8	0	to	5	10	0
Basic Bessemer Plates.....	142.50	5	10	0	to	5	12	0
Open Hearth Plates.....	157.50	6	4	0	to	.....		
No. 2 Iron Rods.....	140.00	5	10	0	to	.....		
No. 3 Iron Rods.....	145.00	5	14	0	to	.....		
Wire Rods.....	137.50	.....			to	.....		

The inquiry for Nails has lessened a good deal lately. The Belgium Nail Syndicate committed a grave error of judgment when, the day after they had been formed, they demanded an enormous increase in prices. A few weeks after this measure had been taken it led to the establishment of two works, one at Fourchies-la-Marche and the other a co-operative society of buyers at Fontaine l'Eveque. The result is that in place of eight works, which complained of overproduction, there will soon be ten.

So far as our industrial shops are concerned it may be noted that those occupied with building railroad cars are well employed, thanks to the important orders received from the Belgian State. The boiler shops, on the contrary, complain of the hard times.

## Cincinnati.

FIFTH AND MAIN STS., January 20, 1904.—(By Telegraph.)

During the past week there has been very little movement in the Pig Iron market, and conditions seem about normal for this season of the year as far as inquiries are concerned. Prices of Southern brands are being firmly maintained, and sales are being made only in quantities to meet immediate requirements. During the past week there were 2500 tons of Northern No. 2 sold to a Springfield, Ohio, foundry at \$13.25; 1250 tons at \$13.55, and 1250 tons at \$13.60, a total of 5000 tons. This is below what Southern Iron could be placed on the market for at Springfield, and seems to indicate that the Northern furnaces are determined to sell their output; if necessary, below the cost of production. These figures practically shut the Southern brands out of territory north and east of Cincinnati. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$13.00 to \$13.25
Southern Coke, No. 2.....	12.50 to 12.75
Southern Coke, No. 3.....	12.00 to 12.25
Southern Coke, No. 4.....	11.50 to 11.75
Southern Coke, No. 1 Soft.....	13.00 to 13.25
Southern Coke, No. 2 Soft.....	12.50 to 12.75
Southern Coke, Gray Forge.....	11.25 to 11.50
Southern Coke, Mottled.....	10.75 to 11.00
Ohio Slavery, No. 1.....	17.00 to 17.25
Lake Superior Coke, No. 1.....	14.65 to 15.15
Lake Superior Coke, No. 2.....	14.15 to 15.15
Lake Superior Coke, No. 3.....	13.90 to 14.90

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$18.75 to \$19.00
Lake Superior Car Wheel and Malleable	18.75 to 19.00

**Plates and Bars.**—Quite a firmer tone is noted in the demand for this class of material. Inquiries are developing and the outlook generally presents a more cheerful appearance than for some weeks past. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.35c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, carload lots, 1.43c., with half extras; the same in smaller

lots, 1.80c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates,  $\frac{1}{4}$ -inch and heavier, 1.73c., in carload lots; in smaller lots, 2c.; Sheets, 16-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; 14-gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire,  $\frac{3}{4}$  x 3-16 and heavier, 1.63c., in carload lots.

**Old Material.**—This is practically a dealers' market. Inquiries remain good, but there is a desire seemingly to delay purchasing. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, \$10 per net ton; No. 1 Cast Scrap, \$10 per net ton; Iron Rails, \$13 to \$14 per gross ton; Steel Rails, rolling mill lengths, \$10 per gross ton; Iron Axles, \$15 per gross ton; Car Wheels, \$11 per gross ton; Heavy Melting Scrap, \$9.75 to \$10 per gross ton; Low Phosphorus Scrap, \$11.50 to \$12 per gross ton.

## New York.

NEW YORK, January 20, 1904.

**Pig Iron.**—In moderate lots a fair amount of business has been done in Foundry Iron during the past week, the greater part of it going to Northern furnaces. The Southern furnaces are holding prices on the basis of \$10 for No. 2, at Birmingham. Meetings to get at some method of controlling the Southern Pig Iron Industry are now going on in this city. We continue to quote: Northern No. 1 Foundry, \$15 to \$16; No. 2 Foundry, \$14.50 to \$15; No. 2 Plain, \$13.75 to \$14.25, and Gray Forge, \$13.25 to \$13.75, tidewater. Tennessee and Alabama brands are quoted: \$14.25 to \$14.50 for No. 1, \$13.75 to \$14 for No. 2, and \$13 to \$13.25 for No. 3.

**Steel Rails.**—The deadlock between the railroads and the Rail mills continues, so far as the Standard Sections are concerned. Some of the leading Rail makers state that while it might have been wise to reduce prices in September of last year, it is now too late, and that present prices must stand. In the meantime old deliveries are being worked off at the pool price, but very little new business has come in. There is a firmer feeling in Light Rails, and some business has been done. We quote \$25 to \$27 for new Light Rails, according to section. Standard Rails continue \$28, delivered.

**Cast Iron Pipe.**—Public lettings are not much in evidence just now, but a great deal of tonnage is being booked privately, and the foundries are in much better shape than usual in midwinter. Carload lots are quoted at \$28 per gross ton for 6 to 10 inch, and \$27 for 12-inch upward, at tidewater, with concessions on large quantities.

**Finished Iron and Steel.**—Among recent important bridge contracts was the Cambridge Bridge at Boston, taken by an Eastern bridge company. The tonnage involved was 7200 tons, on which the price named was \$529,000, which is so much lower than had been expected by the trade that it has caused railroad companies to modify their views relative to retrenchment for this year, and quite a number of them are expected to be in the market shortly for desirable improvements of this character, hoping to take advantage of the reduced prices prevailing as shown by this contract. No decision has yet been reached on the Printers' and Publishers' building in this city, referred to last week, nor on the printing house of the Metropolitan Life Insurance Company on which bids have also been submitted. The former building will take 9100 tons and the latter 1900. Bar Iron manufacturers report a very much better condition of trade, owing largely to the fact that the demand for cars is better. At the same time the general market for Bars is much more active than during the closing months of last year. Sales of Plates are confined to small lots, but such orders are fairly numerous. We quote at tidewater as follows: Beams, Channels, Angles and Zees, 1.74 $\frac{1}{2}$ c. to 2c.; Tees, 1.79 $\frac{1}{2}$ c. to 2c.; Bulb Angles and Deck Beams, 1.84 $\frac{1}{2}$ c. to 2.05c. Sheared Plates in carload lots are 1.74 $\frac{1}{2}$ c. to 1.85c. for Tank, 1.84 $\frac{1}{2}$ c. to 2c. for Flange, 1.94 $\frac{1}{2}$ c. to 2.10c. for Marine, and 1.94 $\frac{1}{2}$ c. to 2.50c. for Fire Box, according to specification. Common Bar Iron, 1.30c. to 1.40c.; Refined Bars, 1.45c. to 1.60c., according to quality; Soft Steel Bars, 1.44 $\frac{1}{2}$ c. to 1.50c.

**Old Material.**—The market is looking somewhat better and prices are a little firmer. A considerably stronger demand is noted for Steel Melting Scrap, and a heavier movement is also reported in Wrought Scrap. Mills are now getting more business and feel disposed to take on more stock. In the present condition of the market buyers must bear in mind that if they desire anything in the character of a special quality or selected stock considerably higher prices must be paid than those ordinarily quoted. Approximate prices, per gross ton, New York and vicinity, are as follows:

Old Iron Rails.....	\$16.00 to \$17.00
Old Steel Rails, long lengths.....	12.50 to 13.50
Old Steel Rails, short pieces.....	11.00 to 11.50
Relaying Rails, heavy sections.....	18.00 to 19.00
Old Car Wheels.....	12.50 to 13.00
Old Iron Car Axles.....	17.00 to 17.50
Old Steel Car Axles.....	14.00 to 15.00

Heavy Melting Steel Scrap.....	11.00 to 11.50
No. 1 Railroad Wrought Iron.....	12.50 to 13.00
Iron Track Scrap.....	12.00 to 12.50
Wrought Pipe.....	9.25 to 10.00
Ordinary Light Iron.....	7.00 to 7.50
Cast Borings.....	5.00 to 5.50
Wrought Borings.....	7.50 to 8.00
No. 1 Machinery Cast.....	12.00 to 12.50
Stove Plate.....	9.50 to 10.50

Arrangements have been completed by which the American Bridge Company, 100 Broadway, New York, become agents for the Interlocking Channel Bar Company of Chicago and New York, who control the Friedstedt sheet piling.

The New York offices of the American Steel & Wire Company will be removed this week to the tenth floor of the Battery Park Building, 21 to 24 State street. This removal was made necessary because of inadequate quarters in the Empire Building. The Battery Park Building is about three blocks south of the old location. It faces upon Battery Park, and is within a block of the South Ferry terminals of all the elevated railways. The United States Steel Products Export Company will at the same time take the ninth floor of the building.

## Metal Market.

NEW YORK, January 20, 1904.

**Pig Tin.**—Shipments from the Far East to London have commenced to increase, and prices there are declining sharply. The first marked drop came on Monday, and immediately corresponding declines were recorded here. With the noticeable absence of demand from American consumers and supplies in London increasing rapidly, the English manipulators are displaying nervousness. As for demand here for consumption, no improvement whatever is to be noted. With declining prices and prospects for a considerably lower level, it is thought that there is little likelihood of American consumers buying any more than their most urgent requirements. Shipments from the East to this port are considerably heavier than expected, amounting to 2585 tons for the first half of this month, as compared with 1660 tons for the corresponding period of last year. At the close to-day prices here were as follows: Spot and January, 28.50c. to 29c.; February, 28.25c. to 29c. London spot, £130 7s. 6d.; futures, £131. Thus far this month 1521 tons have arrived, and it is figured that 2610 tons are now afloat. On Wednesday the Banca sale will be held in Holland, at which 1900 tons will be disposed of.

**Copper.**—The market is very quiet. Prices are unchanged and demand is light. Lake is quoted 12.75c.; Electrolytic, 12.62 $\frac{1}{2}$ c., and Casting, 12.50c. These prices can be shaded  $\frac{1}{8}$ c., however. Exports continue on a very heavy scale. At this time they amount to 15,500 tons for the month, and it is estimated that the total for the entire month will foot up to at least 20,000 tons. These heavy shipments are said to be the result of one large transaction. It is said that a large German house having an office in this city made an offer to the United Metals Selling Company for 50,000,000 lbs., which was accepted with remarkable alacrity. The shipments against this transaction are being made with equal promptness. Interests in the trade are of the opinion that the big companies like this way of doing business and are trying to bring things around so that buyers will do more in the way of making offers for large lots. The London market shows a decline, as compared with last week, being: Spot, £57 17s. 6d.; futures, £57 10s.; Best Selected, £62.

**Pig Lead.**—The market is very firm and spot is quoted 4.55c. to 4.60c. here. St. Louis wires 4.40c., and the London quotation has advanced to £11 16s. 3d.

**Spelter.**—There is no change of importance. The market is quiet. Spot metal is quoted here from 4.90c. to 5.05c. St. Louis names 4.70c., and London had declined to £21 10s.

**Antimony.**—Is steady and unchanged. The market is: Cookson's, 6.75c.; Hallett's, 6.50c., and other brands, 5.75c. to 6c.

**Nickel.**—No change is noted in this market, 40c. to 45c. being quoted for large lots, and 50c. to 60c. for smaller quantities.

**Quicksilver.**—The market is quiet, but steady. Flasks of 76 $\frac{1}{2}$  lbs. are quoted at \$47.50. London is quoted at £8 5s.

**Tin Plates.**—It is reported that the American Tin Plate Company have closed contracts with some of the large consumers, notably the beef packing interests, for their year's supply. Demand from smaller consumers is good. Quotations are made on the basis of \$3.60 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to \$3.79, New York. There is talk of these being shaded 5c. for yearly contracts. The Swansea market has declined 1 $\frac{1}{2}$  pence to 11 shillings 3 pence.

The Pencoyd Iron Works of the American Bridge Company, Philadelphia, are being overhauled, with a view to getting the plant in shape for resumption when the condition of trade may warrant.



### Duty on Sheet Steel in Strips.

WASHINGTON, D. C., January 19, 1904.—The Treasury Department has made a comprehensive decision with regard to the dutiable character of certain sheet steel in strips in which the general subject of classification of similar merchandise is discussed and the law and practice of the Department with respect to reversing or modifying previous rulings are set forth.

The case upon which the Department's decision has been made arose upon a complaint of a prominent firm of importers directed against the action of the Collector of Customs at New Haven, Conn., in assessing duty on certain strip steel at the rate of 1.2 cents per pound, under paragraph 135 of the Tariff act as cold rolled and brightened sheet steel in strips (valued at less than 4 cents per pound), plus 1 cent per pound, as provided by paragraph 141 of the Tariff act. The action of the collector was based upon the decisions of the Department and the Board of United States General Appraisers of March 11, 1902, June 1, 1903, and July 16, 1903, but the importers contended that the merchandise was not subject to the additional duty of 1 per cent. per pound under paragraph 141. The Department's ruling is embodied in the following letter to the importers in question:

"In Treasury Decision 23,587, of March 11, 1902, the Department held that certain sheet steel in strips, one having a plain polished surface, and the balance a blue surface finish, all thinner than 0.025 inch, and valued at more than 4 cents per pound, were dutiable at 45 per centum ad valorem under paragraph 137, and, in addition thereto, 1 cent per pound under paragraph 141. The Board of United States General Appraisers, in G. A. 5347 (T. D. 24,400) of June 1, 1903, sustained the views expressed in the foregoing decision of the Department. In the decision of the board of July 16, 1903 (T. D. 24,379, G. A. 5384), which is particularly called in question by you, it was held that strip steel valued above 3 cents and not above 4 cents per pound, returned by the local appraiser as 'cold rolled and brightened sheet steel in strips under 0.025 inch thick,' was properly dutiable at 1.2 cent plus 1 cent per pound, under paragraphs 135 and 141. By reference to the last-named decision you will observe that there is a similarity between the contentions of the importers in that case and the arguments advanced by you in the present case.

"All the provisions of the law bearing upon this subject (classification) may be summarized as follows: Sheet steel in strips, of common or black finish, 0.025 inch thick or thinner, valued at more than 4 cents per pound, is dutiable at 45 per cent. ad valorem under paragraph 137; on similar strips of the same finish and size or sizes, when valued at 4 cents per pound or less, the rates of duty range from 0.3 to 1.2 cents per pound, according to the value per pound of the steel. Steel strips of the same description thicker than 0.025 inch whether valued at more or less than 4 cents per pound are dutiable at the various specific rates according to the value per pound prescribed in paragraph 135. If the steel strips, being other than polished, planished or glanced steel, have been 'pickled or cleaned by acid, or by any other material or process,' or have been 'cold rolled, smoothed only, not polished' they are subject to an additional duty of two-tenths of one cent per pound more duty than the corresponding gauges of common or black sheet iron or steel, under paragraph 133, but if the same are cold rolled, cold hammered, blued, brightened, tempered, or polished by any process to a perfected surface finish or polish better than the grade of 'cold rolled, smoothed only' they are liable to a duty of 1 cent per pound in addition to the foregoing rates provided for steel strips of common or black finish under paragraph 141.

"From an inspection of the samples submitted by the counsel before the Board of United States General Appraisers, it appears that the samples marked 'Samples of steel imported by Strouse, Adler & Co.' have at least as bright a finish as those marked 'Samples of steel similar to that passed upon in G. A. 5384,' *supra*, a case now pending before the Circuit Court for the Southern Dis-

trict of New York on appeal from the decision of the Board.

"Section 2 of the act of March 3, 1875, provides that 'no ruling or decision once made by the Secretary of the Treasury, giving construction to any law imposing customs duties, shall be reversed or modified adversely to the United States, by the same or a succeeding Secretary, except in concurrence with an opinion of the Attorney-General recommending the same, or a judicial decision of a circuit or district court of the United States conflicting with such ruling or decision, and from which the Attorney-General shall certify that no appeal or writ of error will be taken by the United States.'

"The Attorney-General, to whom the matter was submitted, in a letter dated the 9th inst., expresses the opinion that if this Department 'has made a ruling construing the law governing the importation of the steel in question' the power of the Secretary of the Treasury 'to change that is restrained by the act of March 3, 1875.'

"In view of the foregoing, and the fact that the Department lacks the facilities possessed by the Board of United States General Appraisers, and the courts for eliciting the evidence required to establish the facts necessary to a correct decision in this case, the Department is disinclined to make a ruling which may subsequently prove to be erroneous or to anticipate a judicial decision in the case now pending before the Court on appeal from the decision of the Board of United States General Appraisers (T. D. 24,579, G. A. 5384) hereinbefore referred to. However, you may pursue your remedy under section 14 of the act of June 10, 1890."

The remedy referred to in the closing paragraph of the Department's letter is the right of appeal to the United States Circuit Court in the event of dissatisfaction with the decisions of the collector and the Board of General Appraisers

W. L. C.

**A New Furnace Blown In.**—We are advised by G. H. Schuler, general manager of the Alabama Steel & Wire Company, that the first of the new blast furnaces at Gadsden, Ala., was blown in on the 18th inst. Ground was first broken on November 7, 1902, so that only 14 months and 10 days were consumed in building, which is believed to be a record in the South. Contracts were all placed so that it should have been finished four months earlier, but extraordinary weather and local conditions caused the delay. The furnace is 20 x 90 and has four 20 x 90 two-pass stoves. The product of the furnace will be disposed of in the open market until the steel plant is completed, at which time the entire product will be used in steel making. The steel made at this point will be consumed by the Ensley rod, wire and nail mills.

The Lynchburg Foundry Company of Lynchburg, Va., have established an office at 170 Broadway, New York, in charge of R. C. McWane. The Lynchburg Foundry Company were organized by H. E. McWade, the president, for 15 years president and general manager of the Glamorgan Pipe & Foundry Company. The plant of the Lynchburg Plow Company has been purchased. The company do a general business and have also gone into the manufacture of cast iron pipe, making up to 12-inch. Equipment is being installed, however, to make all sizes up to 24-inch pipe.

A report is in circulation in well informed circles that the differences between the conflicting interests in the United States Shipbuilding Company will soon be adjusted, and that a modified plan for the company's reorganization will be accepted by all concerned. It is stated that two weeks ago friends of the Sheldon reorganization Committee and disinterested representatives of the bondholders who have fought the proposed reorganization plan took up the task of finding a common ground on which the two interests might meet. Conferences toward this end have been held frequently, and it is believed that a compromise plan, acceptable to both the committee and the objecting bondholders, will be announced shortly.

## The New York Machinery Market.

NEW YORK, January 20, 1904.

Throughout the week under review the market was devoid of developments of interest. General conditions are unchanged and while reports of a better inquiry are steadily multiplying, still improvement, so far as actual orders are concerned, seems to be a little slower than the former feature seemed to promise. Summing up the month, thus far, there has been an improvement in actual business—that is, in small transactions, but the larger matters which have held the attention of the trade for some time, have not, as a rule, developed beyond the inquiry stage. In the power plant equipment trade, and particularly in the case of return tubular boilers and the common types of engines, present conditions are held to be particularly promising. In these lines the competition of last year and the declines in prices of raw materials, have brought the prices down to a pretty low level. Projectors of new plants and extensions appear to be working under the impression that present prices are as low as they are likely to be this year, and in a number of instances are seeking quotations for their requirements covering the entire year. This is possible, especially in mill and similar work, where the improvements for the year are decided upon at the annual meeting. The inquiry for the smaller run of power plant equipments indicates a likelihood of an active spring in factory building.

The chief development of the week in connection with large power station work was the awarding of further contracts by the Manila Construction Company of 49 Exchange place, New York. This concern, it will be recalled, have their headquarters with J. G. White & Co., and are purchasing the equipment for the Manila Electric Railroad & Light Company, who are building a large station at Manila, P. I. The contracts which they awarded last week were given to the Alberger Condenser Company of 95 Liberty street, New York. They called for three separate high vacuum surface condensing systems, one of each to operate in connection with a 750-kw. Westinghouse steam turbine. In view of the great distance to which this equipment is to be taken, it will all be of the very highest quality obtainable, so as to obviate as far as possible any chance of breakdown. It is said in the trade that so far as the adoption of modern appliances for the attainment of efficiency and economy go, this station will be as complete as any ever designed here.

Machinery builders are showing considerable interest in the automobile exhibition, which is now in progress in Madison Square Garden. This is attracting many principals of new building projects for the manufacture of motors, automobiles and launches, and convenient opportunities are offered the machinery representatives to talk equipment during their trips to the "Garden."

Another prominent New York machinery house are to pack up bag and baggage and move across the North River. This time it is the Watson-Stillman Company of 204 East Forty-third street. They have purchased the plant of the Jackson Architectural Iron Works at Aldine, N. J., which they expect to occupy early in the spring. In the meantime the plant is to be greatly improved and several additions are to be erected, which, no doubt, will require the purchase of considerable new machinery. The Jackson Architectural Iron Works have decided to close up their affairs and retire from business.

Although the New York plant of the Watson-Stillman Company has always been kept up to date, it is generally known in the trade that the cramped condition of the plant has for a long time prevented Mr. Stillman from inaugurating new systems of manufacture which he has had in mind, and which he has steadily deferred until he could decide upon a location for the new plant which he has had in mind for several years. In the new plant the trade expect to witness interesting departures in the manufacture of high grade jacks and hydraulic machinery.

Richey, Brown & Donald, Greenpoint, Brooklyn, N. Y., are buying machinery to equip their temporary shops, which they have lately enlarged by taking in another floor. Since the destruction of their large architectural works in Long Island City by fire they have been continually expanding and adding to their equipment. The insurance on their plant has been adjusted, and it is now only a matter of a few months when they will be in the market for a large amount of machine tools. Plans for the new buildings are under way, but they have not progressed far enough to determine the dimensions. We can state, however, that the rebuilding of the plant will be commenced as soon as the weather conditions will permit.

It is believed in the trade that Kane & Roach, Syracuse, N. Y., will soon be in the market for a large amount of machine shop equipment to replace that lost in the fire which destroyed their entire plant on January 7. The main building was 100 feet wide and 128 feet long, two stories high. To this an addition, 52 x 82 feet, was erected last spring to assist in getting out rolling mill equipment, and which was equipped with new machinery, most of which they built themselves. They were also planning further extensions this spring. As their business was growing rap-

idly it is generally understood that the firm will rebuild without delay and on a much larger scale. The total loss is estimated at \$55,000, with about \$35,000 insurance.

The Southern Railway Company report the proposed addition to their shops at Sacramento, Cal., of an extension to the machine shop 40 feet high, 80 feet wide and 515 feet long, to be utilized for erecting purposes, and an extension to the pattern shop, 63 x 65 feet, as well as the building of several sheds. The addition to the machine shop will be of steel and brick construction, contract for the steel work having been secured by the Phoenix Iron Company. The total cost of improvements is estimated at \$175,000.

The Maxfield-Francke Company of 120-122 Liberty street, New York, are meeting with excellent success in marketing the Francke four-ported engine, and report a heavy inquiry thus far this year. They have just contracted to supply the following: Under-Feed Stoker Company of America, Chicago, Ill., one 7 by 6 engine and one 5 by 4 engine, direct connected to steel plate forced draft blowers; Struthers, Wells Company, Warren, Pa., one 7 by 6 engine for operating mechanical stoker; James Beggs & Co., New York, one 4 by 3½ engine for operating mechanical stoker; Mershon Patent Shaking Grate Works, Philadelphia, Pa., one 5 by 4 engine for operating disk ventilating fan; M. A. Hicks, Springfield, Vt., one 4 by 3½ engine for driving dynamo; Iowa Heat, Light & Power Company, Des Moines, Iowa, one 7 by 6 engine direct connected to centrifugal pump; Linn Woolen Mills, Hartland, Maine, one 5 by 4 engine direct connected to steel plate blower; Lever Bros. Soap Works, Cambridge, Mass., one 7 by 6 engine for operating mechanical stoker; Robert Dobson Company, Pittsfield, Maine, one 7 by 6 engine direct connected to steel plate blower; McClave-Brooks Company, Scranton, Pa., one 4 by 3½ engine for operating mechanical stoker; George Bowen, South Charleston, N. H., one 4 by 3½ engine for driving dynamo; McMurtrie-Guiler Company, New York, one 5 by 4 engine direct connected to centrifugal pump for export to Porto Rico; Iowa Heat, Light & Power Company, Des Moines, Iowa, one 5 by 4 engine direct connected to centrifugal pump; Northern Engineering Company, New York, one 5 by 3½ engine for driving dynamo. They have also several different makes of generators at the works for which engines are almost ready for direct connecting, and which will be shipped to various points in this country at an early date. Some of these engines are operating as low as 100 revolutions per minute, while others operate at all intermediate speeds up to as high as 800 revolutions per minute.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 2 for the following supplies for the New York navy yard:

Class 36. One electrically driven winch, capable of hoisting 1220 pounds at a speed of 40 feet per minute.

Class 37. One electrically driven winch, capable of hoisting 600 pounds at a speed of 80 feet per minute.

Class 38. One electrically driven drum hoist, capable of lifting 3000 pounds at a speed of 40 feet per minute.

Class 39. One universal 20-inch monitor lathe.

Class 40. One universal 15-inch monitor lathe with 6-foot bed.

Class 41. One 16-inch monitor lathe.

Class 42. One 48-inch engine lathe, motor driven.

Class 43. One horizontal boring and drilling machine with 60-inch swing.

Class 44. One double blind-style boring and mortising machine.

Class 45. One chain mortising machine.

Class 46. One automatic wire straightening and cutting machine, capable of cutting and straightening ¼-inch wire.

Class 47. One wire crimping machine.

Class 48. One universal cutter and tool grinder.

Class 49. One emery grinder for iron and steel.

Class 50. One engraving machine.

Class 51. One double angle shearing machine.

Class 52. One metal cutting band saw.

Class 53. One straightsided power press, 22 inches between housings, and 14 inches between gibs, 6 inches stroke of slide.

Class 54. One 1200-pound steam drop hammer.

Class 55. One automatic bevel gear planer.

Class 56. One automatic spur gear shaper.

Class 57. One bolt pointer.

Class 58. One band resaw stretcher.

The Power & Mining Machinery Company, 52 William street, New York, who recently took over the Loomis-Pettibone Gas Machinery Company and the Holthoff Machinery Company, have received an order from the Impaso Mining Company, Etzaplan, State of Jalisco, Mexico, for a metallurgical and power plant and a large amount of mining machinery. The power equipment will consist of gas generators and Crossley gas engines of about 2000 horse-power. The contract is valued at about \$150,000.

The following bids were opened January 12 for supplies for the Portsmouth and Boston navy yards:

Bidder 1. National Electric Company, Milwaukee, Wis.  
5. J. B. Roach, Brooklyn, N. Y.



8. S. A. Woods Machine Company, South Boston, Mass.  
 9. Hyde Windlass Company, Bath, Me.  
 10. Westinghouse Electric Mfg. Company, Pittsburgh, Pa.  
 12. Bentel & Marquand Company, Hamilton, Ohio.  
 13. D'Olier Engineering Company, Philadelphia.  
 17. Bigelow & Dowse Company, Boston.  
 19. Baird Machinery Company, Pittsburgh, Pa.  
 21. H. A. Rodgers, New York.  
 22. General Electric Company, Schenectady, N. Y.  
 23. Hill, Clark & Co., Boston.  
 25. Holtzer-Cabot Electric Company, Brookline, Mass.  
 26. American Ship Windlass Company, Providence, R. I.  
 27. Thursby Electric Company, Dayton, Ohio.  
 30. H. B. Smith Machine Company, Smithville, N. J.  
 34. American Machinery Company, Grand Rapids, Mich.  
 35. Boston & Lockport Block Company, Boston.  
 36. Manning, Maxwell & Moore, New York.  
 38. Sprague Electric Company, New York.  
 39. Montgomery & Co., New York.  
 40. Drew Machinery Agency, Manchester, N. H.  
 41. Prentiss Tool & Supply Company, New York.  
 44. Manhattan Supply Company, New York.  
 46. Crocker-Wheeler Company, Ampere, N. J.  
 48. Geo. Place, New York.  
 49. C. & C. Electric Company, New York.  
 51. Frye, Phipps & Co., Boston, Mass.  
 52. Cutter, Wood & Stevens, Boston.  
 54. Doubleday-Hill Electric Company, Pittsburgh, Pa.  
 Class 9. Eleven 1½-ton chain hoists and eight 3½-ton chain hoists—Bidder 5, \$927; 52, \$1099.25; 17, 21, 35, 36, 39, 51, each, \$1104.  
 Class 10. Four 7½, one 10 and one 15 horse-power electric motors—Bidder 40, \$1683; 25, \$2663; 54, \$2691; 13, \$2734; 49, \$2842; 1, \$3160 and \$3076; 10, \$3272; 27, \$3293; 38, \$3548; 46, \$3573; 22, \$3924.  
 Class 11. One steam capstan complete with spare parts—Bidder 9, \$1931.50; 26, \$2122.60.  
 Class 12. One chain saw mortiser—Bidder 36, \$522.  
 Class 13. One 9-inch outside molder—Bidder 12, \$412; 30, \$450; 40, \$473; 36, \$494; 41, \$508; 19, \$420; 48, \$585; 8, \$635.  
 Class 14. One double spindle shaper—Bidder 36, \$169; 41, \$172; 30, \$190; 19, \$205; 12, \$210; 40, \$213 and \$184; 48, \$215; 8, \$390.  
 Class 15. One pipe threading, cutting and nipping machine—Bidder 23, \$849 and \$801; 36, \$905; 39, \$914; 40, \$954.20 and \$765; 44, \$979.  
 Class 16. One self-feed rip saw—Bidder 12, \$300; 36, \$386; 8, \$400; 48, \$430; 19, \$438.  
 Class 17. One improved quick acting jig or scroll saw—Bidder 40, \$73; 12, \$78; 41, \$79; 44, \$79; 36, \$83; 19, \$104; 48, \$115; 39, \$240.  
 Class 18. One band saw machine—Bidder 12, \$150; 44, \$154; 40, \$165 and \$145; 36, \$166; 19, \$199; 8, \$210; 48, \$230; 34, \$354.  
 Other bids were opened December 29 for supplies for the New York Navy Yard as follows:  
 Bidder 2. George Place, New York.  
 6. Drew Machinery Agency, Manchester, N. H.  
 10. John B. Roach, Brooklyn, N. Y.,  
 15. R. W. Geldart, New York.  
 19. Bement, Miles and Co., Philadelphia, Pa.  
 26. American Machinery Company, Grand Rapids, Mich.  
 28. Niles-Bement-Pond Company, New York.  
 29. Prentiss Tool & Supply Company, New York.  
 35. Fitchburg Machine Works, Fitchburg, Mass.  
 42. J. H. Johnson, Jr., Company, Philadelphia, Pa.  
 49. Hill, Clark & Co., Boston, Mass.  
 56. Bentel & Margedant Company, Hamilton, Ohio.  
 57. F. H. Woodruff, New York.  
 72. Garvin Machine Company, New York.  
 83. Manning, Maxwell & Moore, New York.  
 85. W. W. Clark & Son, Baltimore, Md.  
 87. Montgomery & Co., New York.  
 89. S. A. Woods Machine Company, Boston, Mass.  
 90. W. H. Foster, New York.  
 93. Fairbanks Company, New York.  
 99. Thomas & Lowe Machinery Company, Providence, R. I.  
 102. J. J. McCabe, New York.  
 105. Hamilton Machine Tool Company, Hamilton, Ohio.  
 108. Hendy Machine Tool Company, Torrington, Conn.  
 109. Jones & Lamson Machine Company, Springfield, Vt.  
 116. American Tool Works Company, Cincinnati, Ohio.  
 Class 12. One concrete mixing machine—Bidder 85, \$975, \$1145, and \$1325; 15, \$799.90, \$959.90, \$1129.90; 57, \$1125; 6, \$1190.  
 Class 13. Two tool room lathes—Bidder 87, \$522; 99, \$817.50; 29, \$820; 49, \$829; 108, \$870; 83, \$896; 28, \$956 and \$1180.  
 Class 14. Three tool room lathes—Bidder 87, \$1080; 99, \$1242.90; 29, \$1269; 49, \$1287; 72, \$1323; 105, \$1344; 108, \$1407; 83, \$1451; 28, \$1845.  
 Class 15. One tool room lathe—Bidder 10, \$448; 99,

\$482.25; 29, \$510; 105, \$514; 72, \$518; 116, \$535; 108, \$569 and \$719; 83, \$581; 49, \$499; 28, \$615.

Class 16. One turret lathe—Bidder 28, \$1325; 109, \$1354; 83, \$1479; 93, \$1503; 90, \$1550.

Class 17. One pattern marker's lathe—Bidder 83, \$127; 29, \$139; 93, \$140; 56, \$160; 6, \$230; 2, \$240; 26, \$432.

Class 18. Two bed extension lathes—Bidder 10, \$2280; 102, \$2570; 83, \$2318; 29, \$2338; 42, \$2362; 28, \$2880.

Class 19. Two bed extension lathes—Bidder 29, \$2978; 83, \$3088; 10, \$3100; 42, \$3126; 102, \$3680.

Class 20. One forge engine lathe—Bidder 83, \$4575, \$7575 and \$6575; 42, \$5431; 29, \$5540; 28, \$5570 and \$6650; 35, \$6075; 19, \$6190.

Class 21. One band saw—Bidder 87, \$99; 29, \$124; 93, \$129.50; 56, \$160; 2, \$188; 83, \$188; 89, \$308; 26, \$337.

Class 22. Four portable drills with motors—Bidder 87, \$985; 72, \$1055 and \$1222; 6, \$1180; 93, \$1198; 83, \$1299.94.

Class 24. One shop surfer—Bidder 93, \$178; 2, \$233.64; 83, \$233.64; 89, \$350; 6, \$400; 56, \$440.

Class 25. One portable boring machine—Bidder 93, \$396; 28, \$400; 6, \$410; 83, \$447; 29, \$495.

Class 26. One cutting off machine—Bidder 99, \$247, \$335, \$445, \$367.50 and \$477.50; 93, \$438; 83, \$399 and \$305; 6, \$498 and \$397; 28, \$510.

Class 27. One milling machine—Bidder 28, \$884; 83, \$1000.

Class 28. One milling machine—No bids.

Class 29. One horizontal boring and drilling machine—Bidder 19, \$949; 83, \$950, \$1050 and \$1375; 29, \$1090; 49, \$1165; 6, \$1725.

### The Central Foundry Company's Universal Pipe.

Since taking up the manufacture of their Universal pipe, the Central Foundry Company, 116 Nassau street, New York City, have found that its special features have won much favor among gas and water works companies. The pipe is made of cast iron, and consequently is more likely to prove durable in the ground; the flexibility of the joint enables a considerable curve to be made in the run of piping without the aid of special fittings, and, further, it can be laid by ordinary labor more quickly than either wrought iron or cast iron pipe with calked joints. They are now receiving contracts for the larger sizes of the pipe by the mile. Orders have been placed first for small quantities for testing purposes, and afterward for varying quantities. Among those ordering from 1 to 10 to 20 miles are the following: Washington Gas Light Company, Washington, Ind.; Guthrie Gas Company, Guthrie, Okla.—an entirely new gas plant; the City of Chicago, South Park system; Delta Water Company, Delta, Col.—a complete new water system; Brooklyn Borough Gas Company; Edison Electric Company, Los Angeles, Cal., and numerous other municipalities and water and gas companies in different parts of the United States. The features which have specially tended to secure the attention of both water and gas engineers are the tightness of the joint and its flexibility. Gas engineers estimate the leakage from lead calked joints in cast iron pipe at from 10 to 40 per cent, of the gas manufactured, while in the Universal pipe the leakage is entirely avoided. Water works engineers find that the pipe stands the higher pressures of water put upon it continuously without leakage, even under fire pressures. The company have equipped their different foundries for manufacturing the pipe and with special machinery for finishing the joints.

The Beaver Valley Metal Company, New Brighton, Pa., expect to cast this week a very large bronze bearing for the Mesta Machine Company of Pittsburgh, for their 40 x 68-inch horizontal and vertical compound engine. The dimensions of the casting will be 3 feet 8 inches long, 2 feet 6 inches wide and 12½ inches high for a 26-inch shaft. It will weigh 2500 pounds and will be made of their recently patented Bauxite bronze.

The Thomas H. Dallett Company, manufacturers of stone working tools, portable drills, pneumatic hammers, &c., Philadelphia, Pa., have appointed Albert E. Doe, Jr., formerly with Norcross Bros. Company, Boston, their New England representative. They are now placing on the market an improved plug drill for quarry work.

### Iron and Industrial Stocks.

Continued strength characterized the stock market during the past week. The better prospect for peace in the Occident influenced the securities market very favorably. Industrial stocks participated in the better feeling on the exchanges. Some noteworthy advances were made, among these being the following: Cambria Steel, 19 to 20½; Crucible Steel preferred, 26½ to 29; Pressed Steel common, 27 to 29½; Republic preferred, 41½ to 43; Sloss-Sheffield common, 31½ to 34; Tennessee Coal & Iron, 36¾ to 39; United States Steel common, 10½ to 11½; preferred, 57½ to 59½. The preferred sold up to its highest price on this movement on January 18, the dividend being off on the day following, when the stock held firmly at 57½ to 58½. An interesting development of the week was the great strength in the new 5 per cent. bonds of the United States Steel Corporation. They became aggressively strong with very heavy transactions. On the 14th they were selling at 71½ to 71¾, advancing to 74¾ on Tuesday, January 19. The last prices of active stocks up to 1.30 on Wednesday afternoon were as follows. Car & Foundry common 19½, preferred 68¾; Locomotive common 17¾, preferred 77¾; Colorado 29¾; Pressed Steel common 29, preferred 69½; Railway Spring common 22¾, preferred 76½; Republic common 7, preferred 43; Sloss-Sheffield common 34½, preferred 79; Tennessee, 38¾; Steel common 11½, preferred 57¾, new 5's 74¼.

It is understood that the announcement that the directors of the Pittsburgh Coal Company have authorized an issue of \$25,000,000 does not mean that all of the bonds are to be issued at this time. In fact, it is believed that less than half of them will be put out in the near future. The company have a floating debt of some \$5,000,000, and during the next year \$1,000,000 of a former issue of bonds will mature. They will be taken up with a part of the proceeds of the new issue. It is not believed that more than \$6,000,000 or \$7,000,000 of the new bonds will be issued now and that the remainder will be put out as needed.

The statement of the Bethlehem Steel Company, showing the results from operations for the year ended July 31 and also for three months ended October 31, 1903, is published, as follows:

	Twelve months ended July 31.	Three months ended October 31.
Gross sales.....	\$8,739,107	\$1,979,483
Net earnings.....	2,443,446	542,534
Depreciation.....	242,478	
Interest charges.....	538,437	130,608
Surplus.....	\$1,662,531	\$411,926

The sharp rise this week in the price of the new 5 per operations. While the contract with the syndicate is attributed to the closing of the bond conversion syndicate's operations. While the contract with the syndicate was abrogated in November, it is stated that they still had on hand a quantity of the bonds to be disposed of. On Monday a deal was completed by which bonds of the value of \$6,000,000 were taken by a prominent bond house. On that day the steel bond transactions on the Stock Exchange were the heaviest for weeks, aggregating one-third of the total bond sales for the day.

**Dividends.**—The Ruud Mfg. Company of Pittsburgh, manufacturers of automatic water heaters, have declared a semiannual dividend of 4 per cent.

The National Fire Proofing Company of Pittsburgh have declared the regular quarterly dividend of 1¼ per cent. on the preferred stock and have elected James H. Willock and Thomas F. Straub to fill vacancies on the Board of Directors.

National Steel & Wire Company have declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable February 3.

United States Cast Iron Pipe & Foundry Company have declared a quarterly dividend of 1 per cent. on the preferred stock, payable March 1. Books close February 9.

Allis-Chalmers Company have declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable February 1. Books close January 25 and reopen February 2.

Lebanon Valley Iron Company, Lebanon, Pa., have declared the regular semiannual dividend of 3½ per cent. on the preferred stock.

The Westinghouse Brake Company, Limited, of London, England, have declared a dividend of 10 per cent. for the six months ending December 31 last, and a bonus of 5 per cent. for the year. Both were payable on January 15. The Westinghouse Air Brake Company of Pittsburgh hold a large portion of the capital stock of the foreign company.

**Clairton Steel Company.**—PITTSBURGH, PA., January 20, 1904.—W. G. Park, one of the receivers of Clairton Steel Company, is in New York this week consulting with officials of the United States Steel Corporation for the purpose of selling the plant of the Clairton Steel Com-

pany to the Steel Corporation. It is the general impression that the Steel Corporation will take over the Clairton plant within a short time.

### MANUFACTURING.

#### Miscellaneous.

The Forsyth Pattern Company, Youngstown, Ohio, have elected the following directors: John J. Stambaugh, Nate Forsythe, W. H. Rudge, J. G. Tipple, and George J. Renner, Jr.

The Auto-Car Equipment Company have been incorporated at Buffalo with a capitalization of \$50,000, and will manufacture motors and other equipment for motor vehicles and launches propelled by steam, gasoline and electricity. The directors are John B. Corcoran, George W. Atterbury and Elmer Olmsted, all of Buffalo.

The Buffalo Garage Company have been incorporated at Buffalo, N. Y., capitalized at \$30,000, and will manufacture, sell, rent and store automobiles and other motor vehicles. The directors are George H. Smith, Benjamin F. Milsom and Byron D. Shultz.

The Standard Metal Furniture Company, Detroit, Mich., have filed articles of incorporation, with stock at \$325,000, of which \$225,000 is common and \$100,000 preferred. The incorporators are Thomas Berry, Frank A. Schulte, S. T. Crapo, Frank F. Tillotson, H. D. Morris, Harry C. Bulkley, V. J. Gillett, D. F. Altland, Percy J. Farrell, M. R. Bacon, F. X. Lingemann, Frank Flier, B. A. Scott, A. H. Green, Jr., F. W. Wheeler, W. H. Yawkey and James B. Book.

The Rawson Electric Company, Elyria, Ohio, will begin the erection of a manufacturing plant this month.

The plant of the Marietta Plaster & Fuel Company, Marietta, Ohio, recently destroyed by fire, is to be rebuilt on a larger scale.

The Lester Mfg. Company, Omaha, Neb., have incorporated with a capital stock of \$100,000 to manufacture a patented envelope sealing and stamping machine and other devices of which J. Emery Lester is the inventor.

The plant of the Pennsylvania Car Wheel Company, in Allegheny, Pa., manufacturers of car wheels, started up last week to nearly full capacity. This plant is owned by the Pressed Steel Car Company and the larger part of the output is used by that company in the manufacture of steel cars.

The Titusville, Pa., plant of the American Radiator Company has resumed after a weeks idleness.

The Pennsylvania and Lackawanna Iron & Steel companies have jointly elected the following directors of the Cornwall & Lebanon Railroad: A. D. Smith, president; George L. Rels, J. R. Savage, B. D. Coleman, Quincy Bent, J. P. S. Gobin, E. S. Felton, F. B. Smink, and T. N. Ely. The Lackawanna Iron & Steel Company elected these officers of the Cornwall Railroad: J. R. Savage, president; Walter Scranton, vice-president; Moses Taylor, treasurer; Howard C. Shirk, secretary; Captain A. M. Patch, superintendent.

The report that the works of the Union Switch & Signal Company, at Swissvale, Pittsburgh, had started up on a very large contract for switching apparatus for the World's Fair grounds at St. Louis, is incorrect. The facts are that this contract was made last spring, and much of the work has been done.

The Kentucky Chain Company, Frankfort, Ky., are now building an extension to their factory for making special Norway chain, which, when completed, will practically double their capacity. The company are having an exceptionally good trade in the South.

The Indiana Engineering Society held its annual meeting in Indianapolis, January 14-16. Among the interesting papers read were: "Smoke Prevention," R. P. King, Indianapolis; "Steam Heating from Central Stations," F. B. Hoff, Indianapolis; "Power Chains and their Use," C. H. Hills, Indianapolis; "Plans for Testing Locomotives at the St. Louis Exposition," Prof. W. F. M. Goss, Purdue University, Lafayette, Ind.; "The Railway Profile Considered With Reference to the Propelling Power of the Locomotive," Prof. W. D. Spence, Purdue University. F. F. Chandler, of the Chandler & Taylor Company, Indianapolis, described a new automatic stationary engine and Prof. G. A. Young, of Purdue, read a paper on the DeLaval steam turbine. One session was given to papers on electric railways. Prof. R. L. Sackett, of Earlham College, Richmond, Ind., was re-elected president; J. B. Nelson, city engineer, Indianapolis, was elected vice-president; R. P. Wood, Indianapolis and J. W. Fulwider, Lebanon, were named as members of the executive committee. The secretary and treasurer are appointive officers. The society will hold its next annual meeting in Indianapolis, January 12-14, 1905.



# HARDWARE.

WHILE those who are advocating the passage of the Parcels Post bill will undoubtedly make an effort to carry their plans into effect at the present session of Congress, they will find their work made difficult, especially at the present time, on account of the criticism to which the Post Office Department is subjected. With its somewhat unsatisfactory financial condition, and more especially on account of charges of fraud and maladministration, some of which are apparently only too well founded, there is little probability that there will be a disposition at this time to enlarge the field of the department to such an abnormal extent as would be involved in establishing a system for the carriage of merchandise in great quantities through the mails. It will not, however, be wise for the opponents of the measure to relax their efforts on this account. Their opposition, however, must be based not so much on the injury the Parcels Post would cause to merchants, serious as this would undoubtedly be, but on the broader principle that it is unwise for the Government to encroach unduly on the domain of private enterprise, and contrary to every right principle to permit the transmission of goods by mail at a loss. The proposed bill would be in contravention of both of these principles.

The conservative course pursued by some of the consolidations which have to do directly with the Hardware and related trades has done something to diminish the hostility with which such concentrations of interests are apt to be regarded. At the same time it is very evident that the hostile feeling in regard to so-called trusts has been intensified by the revelation as to the financing of some of the consolidations. There is a growing conviction, amounting to a determination, which may find expression in legislative enactments, that in future there must be more attention paid to the interest of stock holders and less to those of underwriters and promoters. There is a growing demand that these consolidations be managed on business and not on stock jobbing principles, otherwise there is a certainty that the logic of the consolidation idea and the good business results to be expected from a right use of concentration will be entirely overlooked in a general and sweeping condemnation. It must be remembered, also, that no business, however successful and well managed, can be expected to bear permanently the burden of earning dividends on excessively watered stock, and that sooner or later, in such cases, there must come a reorganization which will put matters on a healthy and natural basis.

An interesting instance of the effect of a new development in one trade upon another line not at all related is shown in the benefit the Hardware business derives from the great growth in the manufacture of machine made shoes. As a consequence of expansion in this direction, the making of shoes by hand has become a dying industry and the shoemaker a disappearing factor. In his place has come the cobbler, who repairs but rarely makes shoes. Likewise the consumer has become his own cobbler, especially true in farming communities, so that a large trade has sprung up in shoe findings, such as Shoe Tacks and Nails, Soles, Awls and Tools, Shoe Heels, Shoe Lasts and the like, and this trade has naturally drifted into the hands of the Hardware merchants. It is proper that those who have not

yet taken it up should at least consider the desirability of doing so.

## Condition of Trade.

There is an increased activity in Hardware and its allied lines. This results from the natural resumption of business in an enterprising way at the opening of the year, the efforts of salesmen both of manufacturers and jobbers who are now canvassing the trade, and the improved tone which prevails in business, and noticeably in Hardware circles. The better feeling which exists shows itself in the placing of orders with fair liberality covering early requirements, but in a conservative and careful way. The advance in Wire and Wire Nails reported last week has had a widespread effect on the market and has stimulated activity not only in this line, but in the trade generally. Merchants take the advance as indicating that in this important branch the conditions justify slightly higher prices than were developed during the comparatively quiet months with which the year closed. The manner in which orders have been coming in to the manufacturers certainly points to an excellent business in this line. Other departments of the trade naturally feel the benefit of this state of things, and there is more liberal buying than for some time. Prices, too, are fairly steady, most manufacturers refusing to make further concessions and showing a disposition to adhere more closely to established quotations. Reports from the South are especially favorable, while the country generally is in a prosperous condition. Notwithstanding the labor difficulties, there is apparently much building to be done, though in some sections the amount will be seriously diminished, owing to the high prices of labor and material, and the uncertainty as to the trouble and disturbance which unionism may cause.

### Chicago.

(By Telegraph.)

The recent advance in the price of Wire and Wire products has given added vigor to the business in all Hardware lines that are directly or indirectly dependent upon Wire. The Wire mills themselves report an exceedingly heavy business in Nails and Barbed and Smooth Wire. Wire Rope has not been advanced in price following the advance in Wire prices, but the tendency to cut prices on the part of independents is somewhat modified. Nuts, Bolts, Screws and kindred lines are moving with fair activity, but in small volumes only. The carload buyer of last year is now a ton-lot buyer, and the ordinary ton buyer now buys by the keg. Galvanized Sheets are sold from store at 75 and 5 to 75 and 7½ off the list in small lots. Strictly spring goods, such as Garden Hoes, Rakes, and small implements, are moving with exceptional activity owing to the prosperous condition of the farmers and the prophecy of a good season to come, based on the heavy snowfall. Demand for Wire Cloth is becoming urgent on the part of jobbers, who wish to protect themselves against the prophesied shortage next summer. Both Wire and Cut Nails are selling freely, the reduction in the price of Cut Nails stimulating that product considerably.

### St. Louis.

(By Telegraph.)

The continued confidence of dealers in the Hardware market is reflected in the increasing demands on the jobbers for all classes of supplies. The amount of demand for Bars, both iron and steel, is encouraging, but in the absence of any concerted action on the part of the local body of jobbers current quotations are considerably mixed. Specifications in other heavy lines are coming to hand in improved volume. Wagon Hardware and materials share in the general advancement of trade.

### Philadelphia.

**SUPPLEE HARDWARE COMPANY.**—Since the opening of the year trade has shown signs of activity, and the cold weather we have had during the entire month has brought in quite a number of orders for season goods, which has somewhat curtailed stocks on some lines. The slight advance in Barbed Wire and Wire Nails was not unexpected by the wholesale trade, although it possibly may have been a surprise to the retail trade. As time has progressed since January 1 there has been a gradual improvement in orders, which is quite a healthy sign for so early in the year. We hope to be able to report a continuation of the same in our letter for the first week in February.

### Cleveland.

**THE W. BINGHAM COMPANY.**—The new year has started in with a good, healthy volume of business, and every thing points to a steady, even trade. We are not looking for cloudy weather, as the horizon is clear and beautiful at the start-out, and we fail to see any reason why, under these bright and smiling skies, we should not continue to have a good, prosperous business during the year. Stocks throughout the country are light, customers have not overbought and farmers have been getting good and even prices for their crops of all kinds. They have money in the banks to spend for luxuries as well as for necessities.

The advance of \$1 a ton on Wire and Nails just made by the American Steel & Wire Company is an incentive for dealers to get under cover at once, as another advance is anticipated in the near future; the large amount of business that is coming to them would justify such an advance. As is well known, supply and demand always regulate prices. The Nail makers inform us that the outlook for spring trade was never better. Stocks in the hands of the jobbers are light and much depleted, as well as the retailers' stocks. The stocks at the mills are exhausted on many sizes. We believe it behooves everybody to anticipate their wants as far ahead as they possibly can, in order to have the goods when they want them, especially seasonable goods. We all know that time rolls around very rapidly in these strenuous days, and it won't be long before the time for the use of many of these goods will be at hand. Therefore, we say, "Supply your wants at once. Get in line for this future business that will certainly come to you before you know it." Business prospects on the whole are very encouraging.

### Nashville.

**GRAY & DUDLEY HARDWARE COMPANY.**—The first month of the new year is running ahead of our expectations. All of the men on the road are having a very large business, and sales will show a considerable increase over January of last year. There is a large demand for Nails, Wire Fencing, Poultry Netting and other goods of this character. Prices are being well maintained. Collections also are very satisfactory.

### Louisville.

**BELKNAP HARDWARE & MFG. COMPANY.**—The new year opens up with a freer order movement in trade circles and a promise of more excellent business as time goes on. We think that those manufacturers who are themselves buyers of the raw or rough material to feed their forges have been overtimid about buying for several months, and, consequently, their own stocks of finished product are very much reduced. At any rate the difficulty of getting assorted orders quickly filled is quite marked, and we fancy that empty stock bins at the factories will be the order of the day until probably the lazy summer time, when all the world goes fishing.

Finances are sound and healthy as far as we can observe, and all efforts to make a bugaboo out of the Presidential year are likely to prove failures. There will be something doing all the time besides listening to superannuated Senators. Of course, not everybody is in position to keep himself in the public eye by touring Europe and incidentally hobnobbing with Pope and Czar, but the

discerning eye, public and private, will doubtless be able to detect some worthy candidates among the "stay at homes"—some one who will wrestle with the currency problem from the basis of sound money—some one who will push the Panama Canal along and not waste time in maudlin sentiment over the interrelations of South American States. The more that the United States have to do with it as a united homogeneous nation, the sooner will civilization spread its beneficent influence over Central and South America.

### Portland, Oregon.

**CORBETT, FAILING & ROBERTSON.**—The year starts off as well as could reasonably be expected. The winter, so far, has been an open one; thermometer to-day, January 13, registering 60 degrees, while it has dropped below freezing point but once during the winter. Roses are in bloom, and have been all the time, and ripe strawberries, grown within the city limits and in the open were picked this week. These cases are only remarkable considering our latitude, being as far north as Montreal, Canada.

Since our last report, the China Commercial Company have announced their withdrawal from San Francisco, and transferred all business to Portland in connection with the Portland & Asiatic Steamship Company. This will give us at once eight steamers, ranging from 5500 to 8500 tons capacity, and sailing every two weeks. This will put us strictly in it as regards flour shipments to the Orient, as we have been badly handicapped in the past. The inbound China steamer comes with a cargo of silk, valued at \$1,000,000, that will go East by express trains. It also has the Philippine exhibit for St. Louis Exposition, that will take 150 cars to transport, besides 2000 tons of Manila Hemp and Jute, showing somewhat the volume of this carrying trade.

The National Wool Growers' Association and National Live Stock Association are both in annual session here at this time, with a large attendance of delegates from all sections of the country, even as far East as the Atlantic Coast, with special train from Chicago, and Texas delegation bringing their own band with them. The Northwest Fruit Association is here at the same time, so the city is lively and crowded to its limit.

While trade is not as lively as it might be, we look confidently to the future for a decided quickening and betterment.

### New Orleans.

**A. BALDWIN & Co.**—The conditions are very favorable for the largest business ever done in the South and Southwest. The high price of the leading staple has infused new life into all country merchants, and the jobbing trade is being swamped with orders from all sections. We look for a phenomenal business during the next 90 days.

### Omaha.

**LEE-GLASS-ANDRESEN HARDWARE COMPANY.**—January is usually one of the quietest months of the year, and we have no exception to the general rule to report at this time. For present consumption the movement of goods is somewhat light, but advance orders booked for later shipment would indicate a run of business of good proportions later on. The time when spring business will be the leading feature of spring trade is approaching, and both jobbers and retailers feel confident that a good business will appear as soon as the winter season shows signs of departure.

The Trans-Missouri region throughout is in excellent condition financially and industrially. All the products of the farm command satisfactory values, and as crops of all kinds have been fairly abundant for a series of years, agriculturalists occupy a financially independent position, which can be regarded as a reasonable assurance that the volume of future business is not likely to show a decrease. Omaha bank clearings for the year just past show a large increase over the previous year, and, taking this recognized business thermometer as an indication of the state of trade hereabouts, it would appear that the present situation is an assurance of future prosperity.



## NOTES ON PRICES.

**Wire Nails.**—The advance made last week by the American Steel & Wire Company and followed by leading outside concerns has had an excellent effect upon the market. Business has been perceptibly stimulated and orders have been coming in freely from both the larger and the smaller merchants. The view is expressed that the mills will not be able to ship carload lots with the promptness that purchasers may desire in the spring, while others predict a shortage of Nails at that time. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....	\$1.90
Retailers, carload lots.....	1.95
Retailers, less than carload lots.....	2.05

**New York.**—Demand for small lots from store continues light. Quotations are as follows: Single carloads, \$2.05; small lots from store, \$2.15.

**Chicago, by Telegraph.**—The advance in prices of Wire Nails, noted last week, had the desired effect of stimulating buying, as both jobber and retailer are disposed to anticipate their needs as a protection against a possible future advance. Prices remain unchanged, as follows: Carload lots to jobbers, \$2.05 per 100 pounds, Chicago; less than carload lots, \$2.15; car lots to retailers, \$2.10, all f.o.b. Chicago.

**Pittsburgh.**—We can report quite an active demand for Wire Nails, one of the leading mills being so well sold up that it may retire from the market before long as a seller. We are advised that the recently adopted prices on Wire Nails are being firmly held, and the mills are working very closely together. It is insisted that unless the large trade place orders very early this year for Wire Nails for spring delivery there will be trouble in getting prompt deliveries in February and March. A meeting of Wire Nail mills is to be held in the Grand Pacific, Chicago, on Thursday, January 21, but it is not expected there will be any change in prices. However, an advance in price of Wire Nails between February 1 and 15 would not be surprising, owing to active demand. We quote Wire Nails at \$1.85 in carloads to jobbers, \$1.90 in carloads to retailers and \$2 in small lots to retailers, all f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, plus actual rate of freight to point of delivery.

**Cut Nails.**—Notwithstanding the fact that the price was reduced 20 cents per keg, the demand has not been very materially increased. The trade generally recognize that the present quotation is low when the cost of production is considered, and are accordingly buying, but are apparently holding off in purchasing, and less disposed to order for future requirements than is the case with Wire Nails. This is in spite of the fact that an advance may possibly be made in sympathy with Wire Nails. Quotations on Steel and Iron Nails, in all quarters, are as follows: \$1.70, base, in carloads, and \$1.75 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

**New York.**—Demand in this locality continues limited. Quotations are as follows: Carloads on dock, \$1.84½; less than carloads on dock, \$1.92½; small lots from store, \$2.

**Chicago, by Telegraph.**—The general impression that Cut Nails cannot be made without loss at the new price announced by the Cut Nail Association is leading buyers to stock up at the low prices while they last. We quote, f.o.b. Chicago: \$1.86½, base, car lots to jobbers; \$1.91½, base, car lots to retailers.

**Pittsburgh.**—We are advised that demand for Cut Nails is showing betterment, actual orders being more plentiful than for some time. We quote Iron and Steel Cut Nails at \$1.70, base, in carloads, and \$1.75 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

**Barb Wire.**—There is a perceptible increase in the demand, and the principal manufacturers have been receiving many orders, some of them quite large. The indications are that the mills will soon be taxed to their full capacity. Recently advanced prices are being maintained,

and the market has an excellent tone. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.20	\$2.50
Retailers, carload lots.....	2.25	2.55
Retailers, less than carload lots.....	2.35	2.65

**Chicago, by Telegraph.**—The advance of \$1 per ton noted last week, coupled with a hint of still higher prices, has resulted in great activity in this market both from large jobbers and from retailers. We quote as follows: Jobbers in car lots \$2.35, Chicago, for Painted, and \$2.65 for Galvanized. Retailers buy their Wire at 5 cents per 100 pounds higher than this price in car lots and 15 cents higher in less than car lots. Staples have been advanced to \$2.20, Chicago, for Plain and \$2.60 for Galvanized to jobbers, with 5 cents advance to retailers.

**Pittsburgh.**—Demand for Barb Wire is quite heavy and the mills are entering a good deal of tonnage for spring delivery. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.20	\$2.50
Retailers, carload lots.....	2.25	2.55
Retailers, less than carload lots.....	2.35	2.65

**Smooth Fence Wire.**—Prospects for spring trade are regarded as good, mills having booked a large tonnage covered by many orders from all classes in the trade. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.85
Retailers, carloads.....	1.90
Less than carloads.....	2.00

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

**Chicago, by Telegraph.**—Business continues to come in great volume to the leading producers, as well as to the independents, the advance in price noted last week being taken seriously by the majority of buyers, who have concluded to cover their requirements before another possible advance. We quote: Base sizes, 6 to 9, \$1.95 per 100 pounds in car lots to jobbers, f.o.b. cars, Chicago; \$2 per 100 pounds to retailers in car lots and \$2.05 in less than car lots, with usual extras for lighter gauges and for galvanizing.

**Pittsburgh.**—Demand is very heavy and the mills have a large amount of tonnage on their books. A further advance in prices is expected before long. We quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days. Plain Wire, \$1.80, base, for Nos. 6 to 9, in carloads to retailers and \$1.90 to \$1.95 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14.

**Cordage.**—For the season there is a fair demand for Rope. Quotations on the basis of 7-16 inch diameter and larger are as follows: Pure Manila, 11½ cents; second-grade Manila, ½ to 1 cent per pound lower; Pure Sisal, 9¼ cents; Mixed Sisal, 8¼ cents per pound. These quotations are subject to a rebate of ¼ cent per pound to carload buyers. It is understood that the Mixed Sisal Rope market is not very strong, and that in some cases orders have been accepted from buyers, who investigate the market closely, at 7¼ cents per pound.

**Binder Twine.**—The coming into the market of the International Harvester Company last year, changed former conditions very materially. It was not until April 1 that the above company announced prices for the season, which Eastern manufacturers adopted, being as usual ¼ cent less than at Chicago, owing to the difference in freight. The International Company will probably follow the same plan as last year, of not giving out prices until April 1, and take so called contracts from their agents based on the price to be named. There does not seem to be any general disposition to make sales, but some small manufacturers are reported as making contracts on the basis of 10 cents for Sisal and Standard.

with prices guaranteed against decline up to April 1 and May 1. It is surmized that 9½ cents for Sisal and Standard, in carload lots, f.o.b. Eastern mill, would yield the maker a profit.

**Paris Green.**—A majority of the manufacturers of Paris Green had an understanding in regard to prices in the beginning of 1903, and quotations started on the basis of 11 cents per pound in Arsenic kegs or casks. During the coming season there will be no price understanding between manufacturers, and the market has already fallen into an undesirable condition. There are irregularities in the base price of different manufacturers, also in the amount of advances for the various sized packages, and the market is continually fluctuating. The following will act as a guide regarding prices:

	Per pound.
Arsenic, kegs or casks.....	11c.
Kegs, 100 pounds.....	11½c.
Kits, 14, 28 and 56 pounds.....	12½c.
Paper boxes, 1, 2 and 5 pounds.....	12½c.
Paper boxes, ½ pound.....	13½c.
Paper boxes, ¼ pound.....	14½c.

One manufacturer is now quoting the foregoing prices. Another is only asking a ½ cent advance for 1 to 5 pound paper boxes. A third is quoting on the basis of 10½ cents in Arsenic kegs or casks. It is difficult to say what further irregularities may develop in the market, but under these conditions it would not be strange if buyers obtained quotations from different sources before placing orders.

**Glass.**—According to decisions reached during the week by representatives of the Window Glass Workmen's associations it is reported that no lower wages will be accepted than those agreed upon on November 5, 1903, which were slightly higher than those paid last fire. Factories are closing down on account of present market conditions, which are said not to allow Glass to be sold at the cost of production. It is reported on good authority that out of a total of nearly 4000 pots only about 1200 are in operation, and that probably there will be less capacity in operation by February 1. Some think that indications point to a shortage of Glass and high prices for the summer and fall trade. Quotations range from 90 to 90 and 10 per cent. discount for carload lots from the manufacturers' price list of January 1, 1901. Jobbers in this section are doing hardly enough business to make a quotable market price.

**Oils.**—Owing to the somewhat higher price of Seed it is regarded by some that an advance in Oil is warranted. The demand is too light to make such a move successful, being confined to supplying immediate requirements. Quotations are as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town and Western Oil, 35 to 36 cents per gallon.

**Spirits Turpentine.**—During the week prices reached 69 cents per gallon for machine made barrels. This price checked buying, and the market fell off ½ cent. The belief is expressed that higher prices will be seen before the new crop is put on the market. Quotations, according to quantity, are as follows: Oil barrels, 68 to 68½ cents per gallon; machine made barrels, 68½ to 69 cents per gallon.

## Hardware Organizations.

### Hardware Merchants and Manufacturers' Association.

The annual dinner of the Hardware Merchants and Manufacturers' Association of Philadelphia will be held at the Hotel Bellevue, on January 26. Arrangements are being made which, it is expected, will make the coming banquet the most interesting in the history of this influential association.

### New England Hardware Dealers' Association.

The annual meeting of the New England Hardware Dealers' Association will be held at the United States Hotel, Boston, on February 10. As usual a dinner will be coupled with the business meeting. The nominating committee consists of William D. Parlin, Natick, Mass., (chairman), Sewall D. Balkam, Jamaica Plain, and George J. Mulhall, Boston.

### Missouri Retail Stove and Hardware Dealers' Association.

The programme for the sixth annual meeting of the Missouri Retail Stove and Hardware Dealers' Association, which will be held at Athletic Club Hall, St. Louis, February 23 and 24, is now in the hands of the printer, and will soon be distributed to the membership. The association will be welcomed to St. Louis by R. H. Meyer, president of the St. Louis Retail Hardware Association, who will make an address at the morning session on the 23d prox. The annual address of Taylor Frier, president, annual report of Frederick Neudorff, secretary, and executive committee report by W. T. Shoop, chairman, will also be presented at this session. At the afternoon session papers will be read as follows: "Successful Advertising," by O. W. Johnston, Marshall; "Value of Missouri Garnishment Law," by W. A. Wengart, Kansas City; "How Best to Meet Department Store and Catalogue House Competition," by E. A. Demeter, Macon; "Work Done by National Association," by M. L. Corey, secretary National Retail Hardware Dealers' Association; "Status of Mutual Fire Insurance as Affecting Our Association," by Frederick Neudorff. A discussion of Stove troubles will also be a feature of this session, in which members and manufacturers' representatives will participate. The matter of mutual insurance will receive attention at the closing session, when action will, it is expected, be taken for the formation of a company.

### Retail Implement and Vehicle Association in Michigan.

The following call for a meeting of Michigan dealers in Implements and Vehicles has been issued under date of the 9th inst.:

In view of the great interest that has been shown in the matter of a State association of the retail Implement and Vehicle dealers, it has been thought best by some of the friends of such a movement to call a meeting for the purpose of forming such an organization, to which all Implement and Vehicle dealers of the State of Michigan are invited, to be held in Representative Hall, Lansing, on Tuesday and Wednesday, February 2 and 3, 1904. The convention will meet at 2 p.m. February 2. Railroad rates will be arranged for, of which you will be informed later. It is hoped that every Implement and Vehicle dealer of the State will feel this matter of importance enough to be present. Everything is combination now; why shouldn't we combine for our own protection?

DUNHAM HARDWARE COMPANY, Lansing.  
GABER & RAY, Lansing.  
JAS. RORR & BRO., Lansing.  
BARTON BROS., Portland.  
HALL & DARLING, Eaton Rapids.  
C. L. GLASGOW, Nashville.  
W. A. WATTLES, Battle Creek.

LANSING, MICH., January 9, 1904.

### North Dakota Retail Hardware Association.

The programme of the annual convention of the North Dakota Retail Hardware Association, to be held in Grand Forks on the 27th, 28th and 29th inst., has been issued, and an inspection of it warrants the anticipation of a very interesting meeting. Among the papers which will be read during the convention are the following: "Uniform Retail Prices and Fixed Terms of Sale by Retailers," by H. J. Hellekson, Fairmount; "Efficient Salesmen," by W. H. Pinkerton, Lakota; "Our Troubles," by G. W. Wolbert, Bismarck; "Should the Hardware Jobber Handle Stoves?" by Geo. L. Nye of the Minnesota Stove Company, Shakopee, Minn.; "Trials and Tribulations of the Hardwareman," by U. S. Conn, Fargo; "Invisible Assets," by R. A. Grim of St. Paul, Northwestern representative of the Michigan Stove Company; "The Merchant and the Local Editor," by W. E. Davis, editor of the *Hardware Trade*, Minneapolis; "Just a Little Nonsense," by H. H. Walther, Casselton. The convention will also be favored with an address by R. A. Kirk of Farwell, Ozmun, Kirk & Co., St. Paul, and ex-president of the National Hardware Association, Mr. Kirk's subject being "Some Ways in Which the Interests of the Retail and Wholesale Hardware Merchants Can be Benefited." The



Question Box will be, as usual, a feature of the meeting, and the entire afternoon of the last day will be devoted to a discussion of such questions as are found in it. All indications point to a larger attendance than ever before. The railroads operating in North Dakota have granted a one and a third fare on the certificate plan, and this rate will also be granted from all points in Minnesota to Grand Forks.

### Iowa Hardware Dealers' Mutual Insurance Association.

The annual meeting of the Iowa Hardware Dealers' Mutual Insurance Association was held at Mason City, Iowa, on the 8th inst. The board, composed of one member from each Congressional district in the State, were nearly all present at the meeting, as well as a representation of the policy holders of the association. The president and secretary presented their reports of the work of the association from its inception. Since the date of the organization of the association about \$200,000 of insurance has been placed upon the books. The financial affairs of the association were reported in a prosperous condition. Some modifications of the articles of incorporation and by-laws were proposed and adopted. It was decided by the meeting that hereafter all regular Hardware dealers carrying Agricultural Implements, furniture, undertaking goods, Harness, Wagons, Buggies and other goods and wares not more hazardous might include these lines in the same policy with the regular Hardware stocks.

The following Board of Directors were elected: Jacob Seither, Keokuk; J. F. Doty, West Liberty; L. Lindenberg, Dubuque; S. R. Miles, Mason City; C. F. Schmidt, Marshalltown; Paul De Vol, Jr., Council Bluffs; C. S. Barger, Albia; L. H. Kurtz, Des Moines; C. R. Keating, Mt. Ayr; L. A. Gnam, Carroll and C. E. Hass, Le Mars.

The association adjourned to meet again at Des Moines at 9 a. m., February 11.

At a meeting of the Board of Directors, following the adjournment of the association, the following officers were elected for the ensuing year: S. R. Miles, Mason City, president; L. Lindenberg, Dubuque, vice-president; L. R. Bailey, Mason City, treasurer; A. R. Sale, Mason City, secretary; members of the Executive Committee: C. E. Hass, Le Mars; L. Lindenberg, Dubuque; S. R. Miles, Mason City, *ex-officio*. The new board at once took up the subject of the coming year's business. Plans were formulated and adopted which are designed to put the Iowa Association in the front ranks of Hardware mutual fire insurance associations. The directors will hold another meeting during the convention of the Iowa Retail Hardware Dealers' Association, to be held in Des Moines, February 10, 11 and 12.

### THE RED BALL.

THE JOHN E. BASSETT & CO., New Haven, Conn., take advantage of the skating season by making their store the headquarters for information regarding

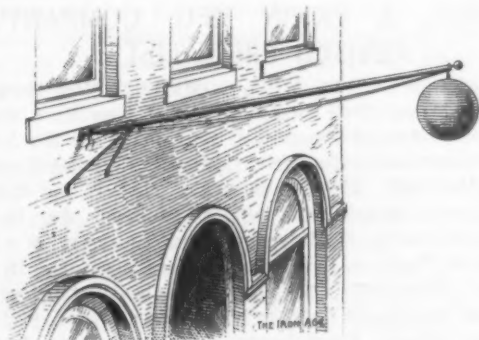


Fig. 1.—The Red Ball in Position.

the condition of ice for skating on the lakes near the city. Whenever and only when there is good skating, there is hung from the flagpole outside of the second

story window of the store a large red ball, by day, such as is shown in Fig. 1. This ball is made of the bladder of the largest size football, and is painted red. At night, instead of the ball there is hung a sign, shown in Fig.



Fig. 2.—The Illuminated Ball.

2, which is made of the sides of a cheese box, the top and bottom of which are covered with red cloth, the word SKATING being painted on the cloth. An electric light is placed inside of this and tells pedestrians for a long distance that there is skating. At the sides of the

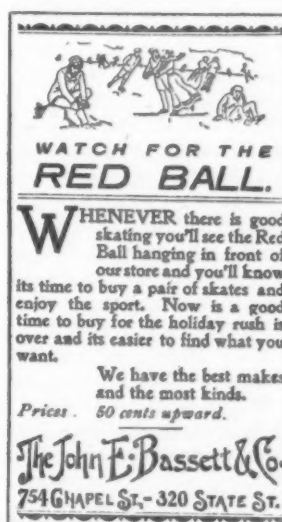


Fig. 3.—Reproduction of a Single Column Newspaper Advertisement.

door are hung printed signs giving the names of the lakes on which there is skating.

Fig. 3 is a reproduction of one of their advertisements in the daily papers, informing the public that the time to buy Skates is when they see the red ball. During the first part of the skating season an 11 x 14 inch card, illustrated in Fig. 4, was used in the street cars to let



Fig. 4.—The Street Car Advertisement.

the public know about the red ball. This is printed on a light pearl card in black, with the exception of the ball, the name of the house and the letters R. B. and the exclamation point in the second line, which are in red. This show card presents a very attractive appearance.

## BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,  
NORFOLK ST., LONDON, W. C., January 9, 1904.

### The British Hardware Trade in 1903.

BRITISH Hardware and Cutlery manufacturers at the beginning of 1903 were firmly of the opinion that we were on the verge of a sort of secondary boom. They argued that with the resettlement of South Africa there must be a greatly stimulated demand for their particular commodities. They assumed, further, that the proclamation of peace would improve commercial conditions at home. These expectations have not been fulfilled. Both in Hardware and Cutlery throughout the year the home trade has been disappointing, both in volume and value. There has not been so much trade done, and the prices have not been so remunerative as during the five previous years. It is true that South Africa bought Hardware in greatly increased quantities, but competition with Germany and America kept down prices to an embarrassing minimum. Those who have reaped the benefits of the cessation of war have been the South African shipping rings. Furthermore, what we have gained in South Africa we have lost in Australia, owing to the drought and to accentuated competition. The fiscal agitation has had an unsettling influence upon trade and commerce, and it is not surprising that the more speculative elements in the trade have remained quiescent, waiting for more definite information as to the direction in which the electoral cat intends to jump. Present appearances point to an electoral reassertion of the principle of free trade. Beyond the general sagging of prices and the growing depression of trade, particularly in the home market, the year 1903 has not been particularly remarkable. The fiscal agitation, if it has unsettled us, has at least turned our eyes in upon ourselves, and we have all of us been examining into the health of the industries with which we are connected. Our self-complacency has, to some extent, been disturbed, but this introspective examination has, on the whole, strengthened Englishmen in the belief that their trade is in a fairly satisfactory condition. Various departments have had their varying experiences, and I will, therefore, deal with them separately.

#### Tubes, Tires, Etc.

In consequence of the slackening of American competition, there has been a slight improvement in the steel tube trade, but the leeway to be made up is probably quite irrecoverable. The year was marked by one important event, namely the amalgamation of Lloyd & Lloyd with Stewart, Menzies & Co., and secondly by the new combination absorbing the Wilsons and Union Tube Company. Midland manufacturers during the year have done a fairly remunerative trade with various foreign and Colonial markets in Gas, Steam, Water Tubes and Heating and Refrigerating Coils, the latter chiefly for ocean steamers in connection with the meat carrying trades.

#### Arms and Ammunition.

Throughout the year there was a marked contraction in demand for military Rifles and stores, the effect of which was felt severely by the makers of Small Arms, Ammunition, Saddlery and Camp Requisites. As, however, all these concerns have done uncommonly well during the war period, they have but little to complain of. The new service rifle required for the rearming of British forces will soon be sent out on contract, all that we are waiting for being the gauges and patterns. The home demand for Sporting Guns and Ammunition was disappointing, owing partly to the unfavorable weather and partly to the depressed state of the landed interest. In addition, foreign competition has been on the increase, and many Birmingham Gun makers are in the habit of importing barrels and other component parts from Belgium, where they can be made more cheaply than in Birmingham, and using them in the manufacture of Guns that are supposed to be of English make. Foreign and colonial orders were up to the average, 95,794 small arms being exported, at a value of £274,-

256, compared with 85,025 at a value of £214,893 in the year 1902. The value of Gunpowder exported reached £169,010, all other kinds of Arms and Ammunition reaching £1,660,329, the total value of Arms, Ammunition and Military Stores exported being £2,103,595, compared with £1,832,230 in 1902, and £2,473,271 in 1901.

#### The Brass and Copper Trades.

The Copper market during the year has been weak and uncertain, but there has been no slump such as completely disorganized the industries dependent upon it towards the close of 1902, when Copper suddenly dropped from £70 to £49 10s. The result of this sudden lapse in price was to hurt the dividends of a number of manufacturing concerns whose balance sheet had to be based on the current price of Copper. This year, if there has been no such slump, has seen an uncertain market, with the result that buying has been spasmodic and irregular. The price of the metal has remained fairly low throughout most of the year, and the result of this has been to stimulate consumption, particularly in Sheets, Tubes and Wire, the latter chiefly for electrical purposes. The price of manufactured Copper articles, however, has been severely cut by the competition, while the home demand has been adversely affected by the depressed state of the shipbuilding trade.

In Brass Goods the home demand has considerably fallen below the average of general brass foundry, the depression in the building trade being an important factor in the situation. There has been a good inquiry for shop fittings, and the makers of Taps, Cocks, Hydrants and Unions have not done badly. There has been a serious falling off in ornamental brass foundry. Brass Fender and Bedstead manufacturers have been fairly busy recently, but taking the year as a whole, expectations have been disappointed both in extent and prices. The value of exported brass and manufactures of brass for the year reached a total of £719,910, as compared with £613,441. No detailed particulars are available; but I suspect this increase is largely accounted for by South African shipments in the earlier part of the year.

#### Iron Foundry and Hollow Ware.

Iron foundrymen have had a bad year, more in the matter of price than as regards the volume of trade done. Pig iron toward the end of the year dropped in price, but even yet its price for manufacturing purposes is high. The result of this is that Midland iron foundrymen are more awkwardly situated for export trade than those on the northeast coast. In the heavier iron foundry work, such as roofing and bridge work, there has been fairly good trade done, but light iron foundry for Telegraph Fittings, Lamp and Umbrella Stands, Fenders, Stoves, Grates and Ranges, while not having much to complain of, has not proved remunerative. Cast Hollow Ware, so much in demand in the colonies and in foreign countries, has been in limited home request, but Enamelled Goods, both cast and wrought, are in increasing demand. Orders for Buckets, Bowls, Tea Kettles, Water Cans, Dust Bins, Coal Hods, Sanitary Appliances, both plain and galvanized, have all been plentiful.

### RUSSELL & ERWIN MFG. COMPANY'S REVISED PRICE LIST.

RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 43-47 Chambers street, New York, have issued under date of January 1, 1904, price list No. 5 for use in connection with their volume 9 illustrated catalogue dated 1899. The first 90 pages relate to the 43 different special designs of Knobs, Escutcheons, &c., in all the various articles of Hardware Trim, preceded by a description of Finishes, Locks and Latches, occupying in all 95 pages. Then follow 88 pages of revised list prices of Lock Sets, Locks and Latches in numerical order, Sliding Door Sets, Knobs, Escutcheons, Adjusters, Bolts, Butts, Store Door Handles, Lifts, Padlocks, Pulleys, Shears, &c. These changes in lists and discounts are in harmony with the action of other important Builders' Hardware manufacturers, based on agreed minimum net prices of the principal makers.



## AMERICAN AXE & TOOL COMPANY'S NEW PLANT.

THE AMERICAN AXE & TOOL COMPANY, which, as a corporation, includes 16 of the prominent Axe and Tool factories in the country, several years ago determined that the best results as regards minimum cost and superior quality could be attained by the concentration of their works at one point in the heart of the Steel market, where the personal attention of the officers could be given to the details of manufacture. The completion of a large plant in the Monongahela Valley, at Glassport, Pa., designed to meet their requirements, is the result of this policy. In marked contrast with its smoky neighbors, this plant is bright and clean. All the machinery in a score of buildings, covering 38 acres, is run by electricity produced by four 700 horse-power, cross-compound engines, connected directly to Westinghouse improved generators. The eight boilers are fitted with automatic stokers, which not only eliminates the smoke nuisance so peculiar to this district, but economizes the consumption of fuel, and proportionately decreases the cost of production. The building devoted to the forging of Tools and Scythes, like the balance of the plant, is of iron construction. This building has a ground floor space of 45,000 square feet, filled with modern machinery for the forging of all kinds of Hatchets, Tools, Scythes, &c., the majority of which are made direct from steel bars in one continuous process by machines, designed, patented and owned exclusively by the company, which enables them to produce a fine article at a minimum cost for labor, fuel and material. The daily capacity of this shop is 200 dozen Scythes and 600 dozen Tools.

The grinding department occupies the building adjoining the forge shop, and has a ground floor space of 33,000 square feet, in which is installed every appliance for comfort and convenience in handling this part of the work, including a complete system of railway and traveling cranes for handling the product. Other conspicuous cost and labor-saving devices are Automatic Polishing Machines, invented and owned exclusively by the company, in operation in the polishing shop, which occupies a ground floor space of 45,000 square feet. The finishing and packing rooms adjoining the polishing shop occupy a ground floor space of 30,000 square feet, and, as everywhere in the entire plant, there are many devices for speed, convenience and economy in handling the product. The warehouse covers a ground floor space of 20,000 square feet, the box factory 3200 square feet, and the machine shop 2500 square feet. Dies, &c., for use in the factory are made here. The company have their own waterworks, with a capacity of 3,000,000 gallons daily.

The remainder of these great works is devoted exclusively to the manufacture of Axes. The forge shops occupy three large buildings having a floor space of 90,000 square feet, and a daily capacity of 1000 dozen Axes. The grinding, polishing, tempering, finishing and packing departments are on the same capacious scale. They adjoin the forge shops and each other in the order named, being connected and served by a railway system aggregating over four miles, the relation of the shops to each other making it possible to enter raw material at one end and deliver finished output at the other end. At this factory are made the Red Ridge Axe brought out three years ago. The Lippincott & Co. Axe, made since 1846, the sales of which, the company say, now aggregate 480,000 annually, is made at their Beaver Falls, Pa., factory. At their East Douglas, Mass., factory, the company manufacture the well known Hunt's Axe, which has been on the market since 1826. Among other brands of Axes manufactured by the American Axe & Tool Company are Bloods, William Mann's, Hubbard's, Hubbard & Blake Mfg. Company, Hurds, Underhill Edge Tool Company, Forest Clipper, Jamestown Axe Company, Red Jacket, Romer Bros. Mfg. Company, Americanax, Peerless, Francis Axe Company, Red Mann, Mountaineer, Robert Mann, Amoskeag Axe Company, Climax, Rough Rider, Niagara, William Stewart's, T. R. Mann & Co., Red Warrior and King of the Forest.

The offices of the company occupy a separate building. It is needless to say that they are admirably equipped in all details.

## DEATH OF CARL SCHMIDT.

CARL SCHMIDT of the firm of Graef & Schmidt, 107 Chambers street, New York, importers of fine Cutlery and American representatives of J. A. Henckels, died Sunday night, January 17, at a private sanitarium in this city where he had been undergoing treatment for an abscess since January 6. Mr. Schmidt gave his attention only to the large trade between Chicago and the Pacific Coast, coming to the New York house usually twice a year to overhaul his samples, his wife, son and stepdaughter living in Pasadena, California.

Mr. Schmidt was born in Berlin, Germany, in December, 1843, coming to the United States as a boy and working his way unassisted to an honorable and influential place in the trade solely by his own unassisted efforts. He was of a genial and sunny disposition and it is said of him that his customers were also warm friends. The firm of which he was a partner, was established by William R. Graef and himself in January, 1884. The funeral services were held at the Stephen Merritt Chapel, New York, and the remains cremated at Fresh Pond, Long Island. The business will be continued along the same lines as heretofore.

## SHEEP SHEARING BY MACHINERY.

AN interesting feature in the recent demonstration to the traveling salesmen of Hibbard, Spencer, Bartlett & Co. of the qualities and merits of some of the special lines handled by them was an exhibition made by the Chicago Flexible Shaft Company of their Sheep Shearing Machines. The principal address was made by Col. W. D. Burch, editor of the *American Sheep Breeder*. Sheep were sheared in the presence of about 100 of the traveling salesmen of the company, a good sized sheep being sheared in seven and one-half minutes in a manner that avoided second cuts of wool, and gave, it is said, a longer fleece, and left it in better shape than could be done by hand shearing. The humanity of the Stewart Clipper was shown by the quietness of the sheep during the operation and his exit unharmed.

## MARSHALL-WELLS HARDWARE COMPANY'S DINNER.

THE MARSHALL-WELLS HARDWARE COMPANY, Duluth, Minn., gave "A Little Supper" to its traveling salesmen, heads of departments and others prominently connected with the business, at the Commercial Club in Duluth, December 30. The menu was printed in an eight-page illustrated pamphlet souvenir, each course being rounded out with jocose references to Hardware, as was the programme of toasts on another page. On two pages were engravings of the main house in Duluth, their new house in Portland, Ore., and their Canadian branch in Winnipeg. On the four following pages were portraits of the executive officers of the company, including A. M. Marshall, president, A. H. Comstock, vice-president, H. C. Marshall, treasurer, and F. W. Parsons, secretary. The marvelous development of the Northwest is reflected in a measure by the growth of this house, whose salesmen cover territory in Michigan, Minnesota, Wisconsin, the Dakotas, Idaho, Montana, Washington, Oregon, and other sections of the Northwest reached by the transcontinental railroads, as well as portions of Canada.

## E. C. ATKINS & CO.

E. C. ATKINS & CO., Indianapolis, Ind., have just issued their 1904 catalogue, Hardware edition, illustrating the complete line of Saws and Tools manufactured by them. A number of new goods have been added, a list of which, with the pages on which they are found, is given on a separate leaf. Goods on which changes in list prices have occurred are also enumerated on the same leaf.

# FACTORY COST AND BUSINESS METHODS.

## THE FACTORY AND OFFICE SYSTEM OF THE ATLAS MFG. COMPANY.

Below is given a part of the rules for the Manufacturing Department of the Atlas Mfg. Company, as given in their Scheme Book, to which are added explanatory notes and illustrations.

### PART III.

#### MANUFACTURING DEPARTMENT.<sup>21</sup>—Page 50.

This department divides itself naturally as follows:

THE CARE OF THE HELP.....	Page 50a
THE ORDER AND THE MATERIAL.....	51
THE PLAN OF MAKING.....	51
THE PLAN OF KEEPING WORK.....	52
PAYING FOR THE WORK.....	53
SCRAP AND ITS DISPOSITION—WASTE, TARE....	54
REPORTS AND RECORDS.....	54
SPECIAL INSTRUCTIONS FOR PARTICULAR ARTICLES	55

#### THE CARE OF THE HELP.—Page 50a.

SEC. 1. The help are hired by the office, ordinarily.

SEC. 2. Each person is given a number when he is hired and a metal check<sup>22</sup> to correspond. Twenty-five cents is charged for this check, being deducted from the first week's pay, and refunded when the check is returned.



Fig. 13.—Brass Check Giving Employee's Number.

SEC. 3. Each one is to ring up on the clock<sup>23</sup> the times of entering and leaving their respective departments. In case of absence, the foreman is to punch an "absent ticket,"<sup>24</sup> and record on this the duration of the absence. The sum of the times on the work tickets and absent tickets should, in each case, foot up a full week.

SEC. 4. Rules and regulations: Such rules as are necessary are to be posted in the shops, also schedules of piecework, and other information which the help should

<sup>21</sup>All the goods made for sale are produced by the manufacturing department.

<sup>22</sup>These checks, one of which is reproduced in Fig. 13, are stamped out of sheet brass. They serve to remind the employees of their numbers, which are used on time slips and pay rolls instead of names. This tends to make the preparation of the pay roll a somewhat easier matter, where some of the unfamiliar Italian names would otherwise have to be puzzled out.

<sup>23</sup>A Rochester time recording clock, manufactured by the International Time Recording Company, New York City, is centrally located in the plant, and is used for recording the times when the employees enter and leave the building, and also when they start in and finish on jobs. Near the clock is a rack, holding the time cards of the various employees. The front of one of the yellow work tickets used is shown in Fig. 14. These measure 2½ x 7 inches. Referring to this it will be seen that 14 hours of work was done between Monday morning and Tuesday noon by the holder of the ticket.

<sup>24</sup>Fig. 15 shows a ticket filled out as an absent ticket. These are made of manila stock of the same size as the work tickets, and are used to record lost time.

have. See page 58a for copy of rules, and under the several departments the rules applying to each.

SEC. 5. Operatives are not allowed in any part of the building outside of the regular running hours, except they may occupy the hat and cloak room whenever these rooms are open. For hours see Page 10, Sec. 1. Perfect order is to be maintained at all times. All hats, cloaks, &c., are to be left in the cloak room and not brought into the work rooms.

SEC. 6. The gong will sound at the following times:

5 minutes of 7 o'clock—Signal for the help to come in and register.

5 minutes of 1 o'clock—Signal for the help to come in and register.

Week ending <u>Oct. 25, 1902</u>							
No. <u>11</u>							
Name <u>Giuseppe Vatrui</u>							
DAY	TIME	BEGUN	FINISHED	BEGUN	FINISHED	TIME	
A. M.							
P. M.							
S							
A. M.		7 <sup>59</sup>	11 <sup>57</sup>			5	
P. M.		12 <sup>58</sup>	4 <sup>57</sup>			4	
M		6 <sup>59</sup>	11 <sup>57</sup>			5	
A. M.							
P. M.						14	
T							
A. M.							
P. M.							
W							
A. M.							
P. M.							
T							
A. M.							
P. M.							
F							
A. M.							
P. M.							
S							
A. M.							
P. M.							
M							
A. M.							
P. M.							
TOTAL							

Fig. 14.—Front of a Work Ticket.

Form No. 30.			
Week ending <u>Oct. 25, 1902</u>			
No. <u>11</u>			
Name <u>Giuseppe Vatrui</u>			
<u>Absent</u>			
DAY	IN	LOST OR OVERTIME OUT	OUT
S	A. M.		
P. M.			
M	A. M.		
P. M.			
T	A. M.		
P. M.	1 <sup>00</sup>	5 <sup>00</sup>	4
W	A. M.		
P. M.			
T	A. M.		
P. M.			
F	A. M.		
P. M.			
S	A. M.		
P. M.			
Total time, <u>Absent</u> 4 hrs.			
Date, _____			
Total wages for week, \$ _____			

Fig. 15.—Front of an Absent Ticket.

7 o'clock—Each one should be in place ready to commence work.

1 o'clock—Each one should be in place ready to commence work.

3 minutes of 12 o'clock—Quit work.

3 minutes of 5 o'clock—Quit work.

Should any have occasion to enter or leave the building during the hours when the regular entrance doors are closed, the office entrance is to be used.

#### THE ORDER AND THE MATERIAL.—Page 51.

SEC. 7. All goods and parts of goods are made on written order from the office. These orders are numbered consecutively from 1 up, and during their execution are referred to as "runs." This order is made in triplicate.<sup>25</sup> Upon the original<sup>26</sup> appears the date, the run number, the department addressed, the quantity of goods wanted, also a list of the material needed and a form to be filled out, showing the disposition made of the order when it has been completed.

SEC. 8. This original is handed to the foreman of the department addressed, and promptly upon the receipt of each order the foreman is to report the same to the tool room and see that the necessary tools are in repair, ready

<sup>25</sup>The orders are held in a book, and the pages so folded on perforations that when two sheets of carbon paper are used, copies of what is written on the original are made on the duplicate and the triplicate. The original goes to the manufacturing department and the duplicate to the store room. The triplicate always remains in the book as the stub. Each of these orders measures 4¼ x 6½ inches.

<sup>26</sup>A reproduction of an original order for the manufacture of 45,000 4 x 5 brackets is shown in Fig. 16, just as it is received by the manufacturing department.





## TRADE ITEMS.

D. B. WOODBURY, Western Manager for the Stanley Works of New Britain, Conn., manufacturers of Hinges and Hinge Bolts, and Hart & Cooley, makers of the Corrugated Steel Hot Air Register, has leased the entire building at 22 Randolph street, Chicago, where he will carry a complete line of goods manufactured by both the above firms. The premises include three stories and basement, 24 x 140 feet in dimensions. The office occupies a space 24 x 50 feet in the front of the first floor, the balance of the four stories being fitted up for stock rooms, with shelving arranged in bins so that each size has its own bin. Mr. Woodbury moved into his new premises about January 1, previous to which time he had his offices with those of the American Screw Company, at 19 Randolph street. The building is equipped with passenger and freight elevators, trolley systems and a chute, facilitating the rapid shipment of orders large or small. While it would be out of the question even with the large amount of space at his disposal to carry stock in great quantities, it is Mr. Woodbury's purpose to have his assortment as complete as possible. His plan of warehousing the goods manufactured by his firms will prove to be a great convenience to Western trade.

THE IDEAL MACHINE COMPANY of Portland, Conn., formerly of Hartford, Conn., have changed their name to the Ideal Mfg. Company, and have increased their capital stock from \$10,000 to \$20,000. The company have extended their field by adding a line of Wire Goods, such as Glove, Collar and Shoe Button Hooks and Shoe Spoons. C. J. Callender has been engaged to take charge of the new lines, in which he has had 16 years of experience. The company are continuing their line of Ideal Reversing Tap Holders.

THE business of Chandler & Farquhar, dealers in Hardware and Machinery, at Boston, Mass., has been incorporated under Massachusetts laws with a capital stock of \$50,000. The name of the new corporation is the Chandler & Farquhar Company. The officers are: President, Frank Chandler; treasurer, Charles S. Farquhar; secretary, F. A. Chandler, and directors, these officials and R. J. Lynd and W. N. Scofield. Mr. Lynd is head salesman in the machinery department, and Mr. Schofield head salesman in the supply department. The incorporation means no change in the business, as the entire business of the firm has been sold to the corporation and the same general management will exist under Mr. Chandler and Mr. Farquhar as an executive committee. The business was established by Mr. Chandler and Mr. Farquhar July 1, 1882, since which time it has grown to be one of the most important in its line in Boston.

CLINTON M. WOODFORD, manager of the Penfield Saw Works of Bristol, Conn., died at his home in Plainville, Conn., as a result of a fall from which he never recovered consciousness. He was born in West Avon, Conn., 57 years ago, and from that town went to Hartford and thence to Canton, where he engaged in business. In his early manhood he was employed by Condell, Maston & Butler of Plainfield and D. B. Judd & Co. of Bristol, and 20 years ago became the manager of the Penfield Saw Works, which position he held until his death.

G. E. WOOD, formerly with the Hurwood Mfg. Company, has organized a new company, known as the G. E. Wood Mfg. Company. The new business will be located at Southington, Conn. They will manufacture a Patent Screw Driver and kindred tools, such as Awls and Chisels, for electricians' use, or for other special work.

THE suit of the Maxim-Nordenfeldt Gun & Ammunition Company, limited, of London, Eng., vs. the Colt Patent Firearms Company of Hartford, Conn., has been ended, the bill of complaint having been dismissed by the United States Circuit Court, in which it has been pending since 1897. An application, approved by both parties to the suit, to have the case dismissed without costs to either party has been approved by the court. The bill of complaint alleged infringement of a patent on a Machine Gun.

CHARLES G. BOWMAN, for 31 years with the St. Louis

Stamping Company, now the National Enameling & Stamping Company, severed his connection January 15 to connect himself with a newly incorporated concern known as the Bowman Stamping Company. Associated with Mr. Bowman in this new enterprise will be Frank P. Crunden, Charles L. Martin and Theophilus Conzelman, all of these gentlemen being connected with the Crunden-Martin Wooden Ware Company of St. Louis. The factory will be located in St. Louis on Cedar street, between Main and Second, and the contract for the construction of the building has been let. Mr. Bowman will make arrangements at once for the necessary machinery and other equipment.

THE UNITED STATES BRAZING COMPOUND COMPANY, New Bedford, Mass., have incorporated, under Massachusetts laws, with capital stock of \$25,000, and have taken over the business of the Eastern Compound Company, manufacturers of Spelter and Flux, and especially of Brazil, a compound for brazing cast iron, cast iron to wrought iron and cast iron to steel. While the new company have no present idea of establishing a new plant, it is their hope that eventually they will occupy a shop where custom forging will be done. The officers of the company are: President, Henry F. Hiller; treasurer, Daniel W. Baker.

WE are advised by the Shelton Company, Shelton, Conn., manufacturers of Bolts, Tacks, Small Nails, &c., that, although they have withdrawn their stock of goods from their New York office at 64 Reade street, as referred to in our January 14 issue, they will still have an office here and make direct factory shipments.

A DEPUTATION of Ontario Carriage Manufacturers called on the ministers of Finance and Customs in Ottawa recently and asked for the passage of an order in council establishing \$50 as the minimum valuation on which to assess the duties on carriages imported from the United States. The object of this effort is to restrict or stop the importation into the Canadian Northwest from the United States of cheap vehicles, which is said to be playing havoc with the trade of Eastern Canadian manufacturers. The United States Buggy sells in Canada for \$25 to \$30, the competing Canadian article being \$10 higher. It is a common occurrence, we are advised, to see solid carloads of carriages and buggies *en route* from Indiana and other States, placarded: "Bound for the Canadian Northwest." The deputation were informed that tariff matters must be dealt with by Parliament, but the request would be considered.

THE ATTWOOD CHAIN WORKS, Eli Attwood, president and general manager, Lebanon, Pa., announce that they have bought back their plant from the Standard Chain Company, who have had it under their control since February, 1900. With it, they state, they have secured not only the plant, but all title in the link bending machine and other modern appliances which have enabled the works during the past year to make a record of manufacturing the large 3 3-16 inch stud link cable chain for the Eastern Shipbuilding Company.

MR. AND MRS. JAMES NICHOLS FRYE celebrated the fiftieth anniversary of their marriage at their home in Brockline, Mass., New Year's Day. Mr. Frye is the senior member of the firm of Frye, Phipps & Co. of Boston and is recognized as the Nestor of the Hardware and Iron trade of Boston, having been in business since 1849.

FOLLOWING a custom inaugurated several years ago, the members of the firm of Robinson Bros. & Company, wholesale hardware dealers, Louisville, Ky., tendered their representatives and heads of departments a banquet on the 30th ult. at Benedict's café. After enjoying a splendid menu the toastmaster, Harry E. Pfingst, secretary of the company, introduced the speakers. Among those who responded to toasts were R. A. Robinson, Joseph Wanless, Charles P. Robinson, C. P. Dawson, D. A. McAfee, W. T. Plummer, Colonel J. P. Harris and J. W. Cook. The occasion will be remembered as one of the most enjoyable gatherings of the employees of this house.

C. I. MARKHAM, who has been for the past nine years sales manager for the Eastern States for Cleveland Twist Drill Company, has resigned. He will have the best



wishes of a host of friends in the trade for his success in the plans which he is making for engaging in business on his own account.

ABOUT four months ago the factory of the U. S. Washing Maching Company, manufacturers of the U. S. Steel Washing Machine, was removed from Chicago to Racine Junction, Wis., this change of base being made on account of the lower cost of production at the new location permitting the company to make better prices to the trade. The company also underwent a reorganization, new officers being elected, and the management thus put in entirely new hands. The company have been incorporated under Wisconsin laws with a capital stock of \$12,000, and with the following officers: J. M. Peterson, president; F. L. Schellenberg, vice-president; Ernest Smieding, secretary, and James Armstrong, treasurer.

### READING HARDWARE COMPANY.

THE READING HARDWARE COMPANY, New York branch, participated in their fifth annual banquet at the Hardware Club, Thursday evening last. An innovation this year was the attendance of the salesmen from the Philadelphia branch, as follows: T. B. Hendrickson, H. S. Hendrickson, J. C. McDonald, H. H. Bronson, R. H. Hutchinson and O. N. Milligan. From Reading came the president of the company, John E. Harbster, S. Y. Reigner, treasurer, John Harbster, Robert Harbster and George Harbster, sons of the president, and Charles Pfaffman. The balance of the company was made up of the New York manager, C. S. Packard, and the following salesmen: F. J. Kelly, W. H. Van Keuren, W. V. Weeks, W. P. Randle and W. H. Arnold. The affair was a most enjoyable one, both from the epicurean and intellectual standpoint, with addresses more or less extended from all. A quaint exhibit shown was a catalogue of the house published in 1858, which revealed marked differences in appearance from those now published, and especially when contrasted with the No. 6 price-list just issued under date of January 2, containing 124 pages of solid matter, giving only revised list prices and discounts applying to their 1897 catalogue, based on the minimum net prices agreed to last year by the principal manufacturers of Builders' Hardware. The great development and progress of this enterprise is also indicated by a comparison of the total sales of 1858, aggregating \$700, with those of 1903, reaching about \$1,500,000. The dinner was served in the governors' room, at a large round table tastefully decorated.

### PEDEN IRON & STEEL COMPANY.

THE fourth annual dinner tendered by the Peden Iron & Steel Company to their employees was held on the 5th inst., at the Rice Hotel, Houston, Texas. The occasion was a most enjoyable one, and thoroughly appreciated by the guests. A number of addresses were made, nearly all of a business character. Among the topics thus touched upon were the following: "The Pleasures of the Credit Department," "The Success of Our Machinery and Mill Supply Department," "Importance of Co-operation Between the Different Departments," "Relations That Should Exist Between the Company and Their Salesmen," "Filling and Shipping Mill Supply Orders," "How One Department Can Assist Another," "The Success of Our Old Lines," "Substitutions of Goods," "Success, and Is a College Education a Requisite?"

### THE ANDREW B. HENDRYX COMPANY.

THE ANDREW B. HENDRYX COMPANY, New Haven, Conn., have just issued an illustrated catalogue and price-list for 1904 of Bird and Animal Cages, Cage Specialties; Bronze, Brass and Iron, Curb, Safe, Ladder, Plumbers', Safety, Single and Double Chain; Wire Picture Cord, Fishing Reels, Spinners, Baits, Minnows, &c. The catalogue is handsomely printed, and contains more than 200 pages.

### PRICE-LISTS, CIRCULARS, &c.

*Manufacturers issuing new catalogues or price-lists are requested to send to THE IRON AGE two copies—one for the Catalogue Department in the New York Office, and one for the Iron Age Library of Trade Literature in London.*

JOHN LUCAS & Co., Philadelphia, Pa.: "Lucas Money Making Helps," an illustrated folder relating to the firm's line of advertising matter for their Paints, including Fence Road Signs, Circulars and Booklets, Display Stands, Showcards, &c.

THE MARKHAM AIR RIFLE COMPANY, Plymouth, Mich.: Illustrated folder and price-list of Air Rifles, both single shot and repeating; also Pop Guns.

KLAUER MFG. COMPANY, Dubuque, Iowa: Illustrated catalogue and price-list relating to Sheet Metal Goods, of which they are manufacturers; also to Galvanized Sheets, Tin Plate and Tanners' Supplies, of which they are jobbers. The Sheet Metal Goods include Conductor Pipe, Elbows, Gutters, Eave Trough, Crestings and Finials, Door and Window Caps, Cornices, &c.

THE WIRE GOODS COMPANY, Worcester, Mass.: Export catalogue devoted to Wire Goods, including Chain and Chain Links, Sash Chain and Irons, Brass Screw Hooks, Finger Nail Trimmers and Cutters, Steel Door Mats, Garment Hangers, Coat and Hat Hooks, Pot Chains, Sink Brushes, &c.

FRANK L. JONES, Utica, N. Y.: Thirty-ninth annual price-list, relating to apparatus, supplies and specialties for cheese factories and creameries, dairies, milk stations, milk dealers, &c.

EMIL GROSSMAN, manufacturer, importer and selling agent, 298 Broadway, N. Y.: Automobile Accessories, including Phare Continental Acetylene Lamps, Oil Lamps, Generators and Lamp Sundries; Imported Horns and Goggles, Spark Plugs, Tire Valves, Adjustable Jacks, Continental Tires and Tire Sundries, &c.

BROWN & SHARPE MFG. COMPANY, Providence, R. I.: Clamp Ring Micrometer Calipers, illustrated and described in a folder. A slight movement of the ring clamps the spindle, but does not rotate the spindle when clamping.

HALE & BENJAMIN, Greenfield, Mass.: Illustrated folder of Automatic Blind Hinges, for wood and brick buildings; also Blind Fasteners. Illustration is also given of Awning Blind Hinges.

READING HARDWARE COMPANY, Reading, Pa.: The Reading Transom Lifter, the same Lifter operating transoms hung in any position. These goods are illustrated and described in a circular.

AMERICAN STEEL & WIRE COMPANY, Chicago, Ill.: Catalogue giving list of products of the company. These include Steel Plates and Sheets, Steel Skelp, Horseshoes and Toe Calks, Round and Flat Wire, Barb Wire, Wire Nails, Spikes, Fencing, Gates, &c.; Bent Wire Goods, Wire Springs, Florists' Wire Goods, Wire Rope and Strands, Wire Rope Fittings, Bale Ties, Wire Rods, Chemicals and Colors, &c.

NICKEL PLATE STOVE POLISH COMPANY, 459-461 Illinois street, Chicago, Ill.: Pamphlet devoted to Stove Polish, Stove Putty, Asbestos Cement, Roofing Cement, Metal Polish, Aluminum and Iron Enamel, &c.

ST. LOUIS SCREW COMPANY, St. Louis, Mo.: Illustrated catalogue and price-list of Bolts, Nuts, Screws, Taps, Washers, &c. The list prices are the standard ones adopted by the Milled Machine Screw and Bolt Manufacturers' association.

THE ADAMS COMPANY, Dubuque, Iowa: A 16-page booklet illustrating and describing their Stove and Hardware Specialties.

PORT HURON STEEL & SCREW COMPANY, Port Huron, Mich.: Price-list devoted to Cold Drawn and Rolled Steel Shafting, Cold Drawn Screw Stock, Set and Cap Screws, &c.

THE GEO. DELKER COMPANY, Henderson, Ky.: Catalogue No. 32, devoted to Vehicles, including Driving Wag-

ons, Buggies, Phaetons, Traps, Surreys, Spring Wagons, &c.

**SUPERIOR TAP COMPANY**, Springfield, Vt., represented by Carlisle & Van Gelder, 17 Warren street, New York: Illustrated catalogue, Series A, of **High Grade Standard Taps**. This will be followed shortly by a catalogue of **Standard Dies**.

**PENN RADIATOR COMPANY**, Corry, Pa.: Leaflet relating to their **Agricultural Wrench**, with drop forged solid steel bar, special claims being made for the strength of this Wrench.

**THE IRVINGTON MFG. COMPANY**, Irvington, N. J., for whom John H. Graham & Co., 113 Chambers street, New York, are selling agents: An illustrated descriptive catalogue of **Warranted Forged Tools**, such as Linemans and Combination Pliers, Farmers, Button and long Flat Nose Pliers, Side Cutting, and a variety of other Special Pliers, Rivet Sets, Splicing Clamps in various styles, Come Along Clamps, Spring Punches, Revolving Punches, &c.

**CRAWFORDSVILLE WIRE & NAIL COMPANY**, Crawfordsville, Ind.: Printed matter relating to Wire Nails, Bale Ties, Telephone and Telegraph Wire, Smooth Fence Wire, Poultry Netting, Woven Wire Fencing, &c.

**NATIONAL CYCLE MFG. COMPANY**, Bay City, Mich.: Illustrated catalogue for 1904, showing Chain Bicycles with and without cushion frames, also Chainless machines.

## STOWELL MFG. & FOUNDRY COMPANY'S DINNER.

**STOWELL MFG. & FOUNDRY COMPANY**, South Milwaukee, Wis., tendered a dinner on the 5th inst. to their salesmen, which proved to be such an enjoyable and profitable reunion that it is the intention of the company to make it an annual affair. Among those present were the following officials of the company: Charles E. Sammond, Robert Moscrip, Thomas W. Ferguson and A. J. Ricker. The salesmen present were: R. T. Brady, Chicago representative; W. L. Bigelow, who has recently been added to the selling force of the company, having been for the last six years salesman for Morley Bros. of Saginaw, Mr. Bigelow making his headquarters in Detroit and visiting the trade in Indiana, Ohio, Michigan and Southern Canada; W. S. Deighton, another new acquisition to the selling force, who will represent the company in Kansas, Missouri, Texas and Oklahoma and Indian territories, with headquarters in Kansas City; John J. Dalton, who travels in Iowa, Nebraska, Minnesota and North and South Dakota, and M. J. Evans, who looks after the trade in Illinois and Wisconsin. J. M. Boyd, the inventor of the company's well-known line of Hay Tools and the manager of the Hay Tool department, was also among the guests.

## PITTSBURGH STEEL COMPANY.

**PITTSBURGH STEEL COMPANY**, Pittsburgh, Pa., under date of January 1, issue a catalogue and price-list of "Pittsburgh Perfect" brands of Wire Rods, Annealed, Bright and Galvanized Smooth Wire, Painted and Galvanized Barb Wire, Twisted Cable Wire, Wire Nails, Fence Staples, Fencing, Steel Hoops, Bands and Cotton Ties. A view is presented of their extensive plant at Monessen, Pa., which is especially well equipped and splendidly situated for the prompt execution of orders.

**M. G. RODEARMEL**, manufacturers' agent, 212-214 Commercial Building, Minneapolis, Minn., has just issued a neat booklet giving a list of the manufacturers (and their products) for whom he will act as sales agent during 1904 in the Northwest. The list includes, among others, Schreiber & Couchar Mfg. Company, Eureka Digger Company, Stover Mfg. Company, Edwin Hills, Johnston & Sharp Mfg. Company, S. R. Slaymaker, National Hardware Specialty Company, Jacob J. Vollrath Mfg. Company, Indiana Chain Works, Indiana Mfg. Company, Animal Trap Company, American Tube & Stamping Company, Dana & Co., Searls Mfg. Company, Goodell Company, Berridge Shear Company, Clayton Bros., Wilson Toaster & Specialty Company.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

**REQUESTS** for catalogues, price-lists, quotations, &c., have been received from the following houses:

FROM **R. E. ZIMMERMAN**, Beaver Falls, Pa., dealer in Hardware, Stoves, Paints, Glass, &c., who about February 1 intends to add House Furnishing and Sporting Goods to his present lines, and desires catalogues and price-lists relating thereto. Mr. Zimmerman has recently bought the property corner Sixteenth street and Seventh avenue, and is now remodeling it with a view to adapting it to the requirements of his growing business.

FROM **A. C. CANDOR & Co.**, Lock Haven, Pa., who are going to take up the wholesale business, and desire copies of the latest catalogues and price-lists.

FROM **STEPHENSON & GARRARD**, Oxford, Ohio, who are dealers in General Hardware, Stoves, Furnaces, House Furnishing Goods, Paints and Electric Fixtures, and also workers of Sheet Metals. The firm's business is chiefly retail, but some jobbing is also done.

FROM **NORFOLK BARGAIN HARDWARE STORE**, 66 Atlantic street, Norfolk, Va., who have recently commenced business as dealers in Light Shelf Hardware, Cutlery, Mechanics' Tools, Wood and Willow Ware, Sporting Goods, &c. They will make a specialty of 5, 10 and 25 cent counter goods.

FROM **THE HARDWARE JOBBERS' PURCHASING COMPANY**, 2 Hudson street, New York, who request copies of catalogues of General Hardware from manufacturers in this line.

FROM **CHRISCHILLES & CAULFIELD**, Salix, Iowa, who have lately bought the Shelf and Heavy Hardware, Stove, Agricultural Implement and Sporting Goods, business formerly conducted by Charles Kelsey. Glassware, Chinaware and Lamps will be added.

FROM **MOSHER & CHAPMAN**, who have succeeded Buol Bros., Hardware, Stove and Tinware merchants, Randolph, Neb.

FROM **RECTOR BROS. & RARDIN**, who about the middle of February will open up in the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Oils and Sporting Goods, at Parkersburg, W. Va.

FROM **KELSO & FITZSIMONS**, who have succeeded Kelso & Welmer in the General Hardware, Vehicle and Farming Implement business, at Carleton, Neb.

FROM **B. W. & I. E. HEWITT**, Maple Rapids, Mich., who have acquired the General Hardware business formerly carried on by Jacobs & Hasse.

FROM **MICHAELS BROS.**, who have recently opened a store at Sturges, Mich., handling Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints, Sporting Goods, &c.

FROM **FOWLER-RICHARDSON HARDWARE COMPANY**, Graham, Va., who have recently been incorporated to carry on the wholesale and retail business in Hardware, Farm Implements, Stoves, Paints, Sporting Goods, &c.

FROM **WILKES-BARRE HARDWARE COMPANY**, Wilkes-Barre, Pa., who have just commenced business at 9 South Pennsylvania avenue. The manager of the business is M. E. Holcomb, who for the past 17 years has been with the Williams Hardware Company, of the same city, the last five years as manager. For the present only a retail business will be done, but about April 1 a wholesale department will be opened. The lines handled by



the company, include Shelf Hardware, Stoves, Mantels, Sewer Pipes and Fittings, and Plumbers', Painters', Tinners' and Miners' supplies.

FROM LANDES & JOHNSTON, who are successors to L. R. Kelly in the Hardware, Stove and Farm Implement business in Danville, Iowa.

FROM M. J. PFISTER, Great Bend, N. Y., who has lately opened up in business, handling Shelf and Heavy Hardware, Stoves and Tinware and Agricultural Implements, with heating and plumbing department.

FROM A. J. YARRINGTON who has recently bought a Hardware, Stove, Agricultural Implement, Paint, Oil and Sporting Goods stock at Malmo, Neb.

FROM UNION HARDWARE SUPPLY COMPANY, New Cumberland, W. Va., who have been organized with a capital of \$10,000, to conduct the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints and Oils, and Sporting Goods. They will also manufacture Brick Cutting Wires and Elevator Buckets.

FROM W. F. FILBERT & Co., Twin Brooks, S. D., who have purchased the Hardware, Stove, Paint and Farm Implement business of Telshon Bros.

FROM WILLIAM BEACH HARDWARE COMPANY, who have succeeded William Beach in the general Hardware business at Columbus, Ga. The company will be incorporated with a capital of \$25,000 paid in, with O. C. Bullock as president, and W. B. Beach, secretary and treasurer. They will conduct a wholesale and retail business. This stand is an old one, having been established in 1827, and Wm. Beach has been connected with it for about 63 years, although not at first as a partner in the business.

FROM A. M. CLARK & SONS, who have lately opened a store for the sale of Hardware, Stoves, Tinware, Paints, &c., at Storden, Minn.

FROM E. R. MORTON & SONS, Bagley, Iowa, who have succeeded the Bagley Hardware & Implement Company.

FROM W. B. MILLER, who has purchased the Hardware, Stove, Agricultural Implement and Paint business of F. S. Wetmur, Winthrop, Iowa.

FROM THE WATERBURY HARDWARE COMPANY, Waterbury, Conn., who are conducting the retail business in Shelf and Heavy Hardware, Agricultural Implements, Sporting Goods, &c.

FROM W. A. CHASE, Willis, Kan., who is successor to J. J. Comer in the Hardware, Stove, Farming Implement, Paint, Harness and Sporting Goods business.

FROM G. P. HOLZ, Ridgefield Park, N. J., who has recently purchased the Hardware, Stove, Tinware, Paint, Varnish and Glass business heretofore conducted by E. Holz.

FROM JOSEY HARDWARE COMPANY, Scotland Neck, N. C., who will soon commence the erection of a new store, and will be glad to receive catalogues relating to store furniture, such as Ladders, Shelf Boxes, Show Cases, Nail Bins, &c., also Elevator.

### CALENDARS, &c.

THE GREER-CLARKSON COMPANY, contracting engineers, Manheim, Pa.: Monthly hanger calendar.

WALSH'S SONS & Co., scrap iron and metals, Newark, N. J.: Weekly hanger calendar

AMERICAN ELECTRICAL HEATER COMPANY, Detroit, Mich.: Nickel-plated sad iron paper weight.

THE SPRINGFIELD MACHINE TOOL COMPANY, Springfield, Ohio: Monthly hanging calendar.

CLARKE-RUTKA-WEAVER COMPANY, Wholesale Hardware, Grand Rapids, Mich.: Monthly hanger calendar.

### HARDWARE ASSOCIATION MEETINGS.

THE following meetings of State Retail Hardware associations are announced to be held during the next few months:

TENNESSEE, January 14 and 15, Knoxville.

NORTH DAKOTA, January 27, 28, 29, Grand Forks.

WISCONSIN, February 3, 4, Milwaukee.

NEBRASKA, February 9, 10, Omaha.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION, February 10, Boston.

IOWA, February 10, 11, 12, Des Moines.

COLORADO, February 15, Denver.

INDIANA, February 16, 17, 18, Indianapolis.

PENNSYLVANIA, February 16, 17, Williamsport.

ILLINOIS, February 23, 24, East St. Louis.

MISSOURI, February 23, 24, St. Louis.

OHIO, February 23, 24, 25, Cleveland.

MINNESOTA, February 24, 25, 26, St. Paul.

CALIFORNIA, March 2, 3, San Francisco.

NEW YORK, March 8, 9, 10, Rochester.

NATIONAL, March 15, 16, 17, Indianapolis, Ind.

INDIAN TERRITORY, May 10, Oklahoma City.

ARKANSAS, June 14 and 15, Little Rock.

MICHIGAN, August 10, 11, Grand Rapids.

### TENTH ANNUAL SPORTSMEN'S SHOW.

THE tenth annual sportsmen's show, to be held in the Madison Square Garden, New York, during the two weeks from Friday, February 19, to March 5, inclusive, will include a lake on the Fourth avenue end of the building, 70 x 190 feet, designed principally for practical demonstrations of high power automobile launches, varying in length from 25 to 35 feet, it being the intention to make the marine feature of the show a specially strong one. The entire lake frontage has been given up to Marine Exhibits in the way of Marine Engines, Power Launches, &c. Thus far space has been assigned to the following representative concerns in this line: Western Gas Engine Company, Mishawaka, Ind.; J. W. Newbury, New York; Pierce Engine Company, Racine, Wis.; C. H. Blomstrom Motor Company, Detroit, Mich.; Lozier Motor Company, Plattsburg, N. Y., and New York City; Panhard & Levassor, Smith & Mabley, Hollander & Tangeman, Gas Engine & Power Company, Charles L. Seabury & Co., Wm. H. Brodie Company and Fairbanks Company, New York City; Electric Launch Company, Bayonne City, N. J.; Eagle Bicycle Mfg. Company, Torrington, Conn.; United States Long Distance Auto Company, Jersey City, N. J.; Lackawanna Motor Company, Detroit, Mich.; Chas. A. Strellinger Company, Detroit, Mich.; Buffalo Gasoline Motor Company, Buffalo, N. Y., and Reeves & White, Port Richmond, N. Y.

To the allied exhibits of the Canadian guides of the Quebec and Ontario provinces more than 80 running feet have been assigned. Wyoming, Montana and the Rockies will send typical exhibits, and one of the interesting new competitive features of the exposition will be contests between the guides of these two sections in saddling, off saddling and packing horses, just as it is done in Canada and the Rocky Mountain sections, when pitching or breaking camp by hunting parties. Maine and the Adirondacks will be prominently represented, among whose guides will be contests in portage and canoe races. From Virginia and Long Island will come representative guides, the latter baymen well known along the Great South Bay.

The loan exhibit will include trophies of big game, hunting and fishing trips. This year there will be a return to the exhibition of live game, animals and game birds. A programme of water sports is being arranged, embracing canoe tilting, canoe racing and a number of novel features, one of which will be push ball, played, however, with canoes instead of horses as has been done in the riding academies.

For the first time, the Sportsmen's Exhibition Company will this year inaugurate the opening of the show with a banquet, to be held in the Garden restaurant.

## THE MEYER & CHERRY COMPANY.

**T**HE MEYER & CHERRY COMPANY were recently incorporated under New York State laws, to deal in Hardware, with a capital of \$25,000, all of which is paid in. They are now fitting up a store at 26 West Twenty-sixth street, near Fifth avenue, New York, which is admirably located for close contact with architects, builders, contractors and their clients. They have been appointed sole representatives of the Chicago Hardware Company, Chicago, Ill., for Greater New York and vicinity, and will as the business develops take on other lines of this character, doing strictly a wholesale business. They have the street floor and basement, each 25 x 100 feet, with an exceptionally well naturally lighted showroom in the rear, which is being fitted up in hard wood to advantageously display samples, there being also a fine show window in front. The officers are Edward Meyer, president, and William A. Cherry, secretary and treasurer. Mr. Meyer is well known to the trade through his 25 years' connection with the Russell & Erwin Mfg. Company, where he was second vice-president and New York manager until the beginning of this year. Mr. Cherry was with the same concern for nine years and in charge of the Builders' Hardware department. Several of the salesmen of the new company were in Mr. Cherry's department in the old house for long periods, up to 20 years. The premises are being arranged with a view to effectively exhibiting samples not only to the trade, but to owners of prospective buildings who may be taken there by architects, &c., to select Hardware trim.

## MISCELLANEOUS NOTES.

### Emery Wheel Dresser

Walker & Ehrman Mfg. Company, Chicago, Ill., are manufacturing an emery wheel dresser for truing, shaping, sharpening and removing glaze from solid emery wheels running at full speed. The bushings and cutters are made of hardened tool steel. The cutters run on loose pins with hardened steel bushings. All parts are made interchangeable, and can be replaced at nominal cost, if necessary. The milled tooth cutters used in this dresser are individually tempered and drawn by an expert, we are advised.

### The O. K. Tool Holders and Tools.

The O. K. Tool Holder Company, Shelton, Conn., have just gotten out a new drill holder, and have increased the size of their regular holders by the addition of three new sizes, designated as D, E and F. The D holder is  $\frac{3}{4}$  x  $1\frac{1}{2}$  inches, size E is  $\frac{7}{8}$  x  $1\frac{1}{2}$  inches and F is 1 x  $1\frac{1}{2}$  inches. They have also added a great variety of new tools made of Novo steel, and the demand is such that they are running night and day with two shifts of men, we are informed. They have just issued a pamphlet catalogue illustrating and describing these goods for general distribution.

### Brazing Brass.

The Ambler Saw Mfg. Company of Natick, Mass., are putting on the market a line of brazing brass put up in metal boxes containing 1 ounce each. It is claimed for this brazing brass that fully as good results are obtained as with silver solder. The Ambler Company are using the brass in brazing their band saws.

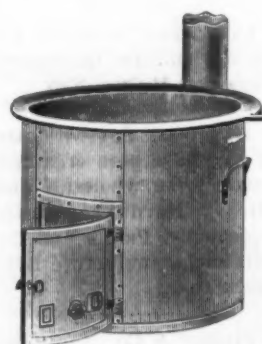
### The Wire Goods Company

The Wire Goods Company, Worcester, Mass., have adopted a consistent color scheme, which is extended not only to the boxes and wrappings for their goods, but also to their catalogues and discount sheets. All paper boxes and wrapping paper are of a dark slate color, of a peculiar shade, and all labels are of canary yellow. Upon the labels the names of the articles contained are printed in conspicuous letters, and the size and quantity are given equal prominence. The covers of all catalogues and other literature are of the same tint of yellow, against

which the black type appears in strong contrast. In this way an individuality is given to the company's publications, and more especially to their goods, which include 3200 different articles and sizes.

### American Cast Iron Feed Cooker.

The cast iron feed cooker which is illustrated herewith is manufactured by the Tallyday Steel Pipe & Tank Company, Waterloo, Iowa. Inside the casing of



American Cast Iron Feed Cooker.

the cooker is placed a cast iron flue to throw the fire and smoke up around the kettle before it passes into the smoke stack, so that this direct contact with the fire will permit of very quick heating. The cooker is made without legs, to be easy to dip into and out of. No. 16 sheet steel is used in the construction of the shell which is air tight. The cookers range in size from 30 to 110 gallons and are made smooth, painted and are tested with water and guaranteed.

### Great Western Corn Sheller.

Beadle & Co., 134 South Market street, Nashville, Tenn., are introducing the corn sheller shown herewith. It is referred to as being medium in size so as to be portable, weighing about 50 pounds. It is ball bearing.



Great Western Corn Sheller.

and is alluded to as having a capacity of from 100 to 150 bushels of shelled corn per day. Among the features of the machine the following are mentioned: that the small and imperfect grains of corn on both ends of the cob are taken off and kept from mixing with the perfect grains; that the corn is fanned during the shelling process, and that the grains of corn are not cut or bruised in the operation. Crated for shipping the sheller occupies a space 2 feet long, 15 inches wide and 18 inches high.



### Three-Coin Registering Savings Banks.

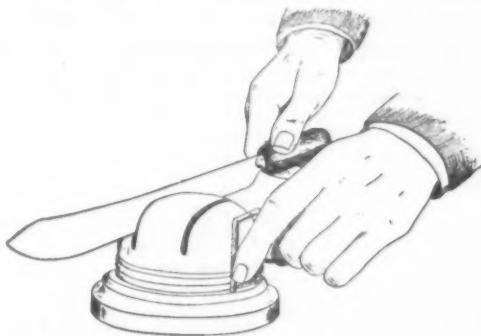
The Piaget Novelty Company, 265 Broadway, New York, manufacturers of registering savings banks, patented specialties and novelties, have recently put on the market the three-coin registering bank here shown, constructed to register nickels, dimes and quarters, American money—i. e., 5, 10 and 25 cent pieces. The bank, in barrel form, is made of pressed steel, antique copper finish, the outer dimensions of which are: Height, 4 inches; diameter at heads,  $2\frac{7}{8}$  inches; distance through center,  $3\frac{7}{8}$  inches, and weighing 12 ounces. The capacity of the registering mechanism is \$5, automatically and correctly recording through a single slot the face value of each coin inserted, regardless of the order in which they are introduced or whether of one kind or mixed values. When a total of \$5 is in the bank it can be opened, and only then, separating laterally on a line with the fourth hoop from the bottom. In operation any of the coins named are pushed into the horizontal slot at the right



Three-Coin Registering Savings Bank.

of the small projecting lever and the finger piece pushed forward, thus causing the piece to fall into the body of the bank and simultaneously registering the coin's value. Each bank is attractively put up in a cardboard box and packed six dozen in a case. The company also make for the Canadian market a similar bank to receive and register 5, 10 and 25 cent Canadian silver pieces, which will also register the corresponding values in American coins, as well as the American 5-cent or nickel piece, notwithstanding the marked difference between the Canadian silver and American nickel pieces. The mechanism of this bank can also be adapted to the coins of any foreign country. The company likewise make registering savings banks of cast iron, nickel plated, in the form of a Saratoga trunk, one of which is for pennies and dimes, with a separate slot for each coin, and an-

rotates the wheel, grinding an accurate edge, it is explained. It is remarked that the grinder requires no water, that it grinds hard or soft steel with equal ease, that it does not heat or glaze, that the wheels being placed at the

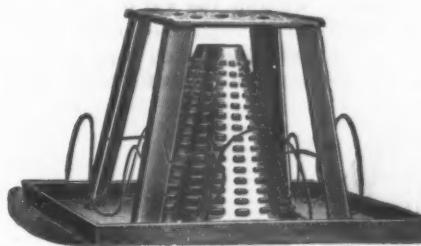


The Rose Automatic Grinder.

proper angle give the blade a keen and uniform edge, without blunting and rounding it, and that the grinding surface always remains true. The grinder has a nickel plated top and polished base, and is referred to as an ornament on any table. It is manufactured by I. M. Rose & Co., Philadelphia, Pa., who also make a similar grinder for scissors.

### Wilson Bread Toaster.

The toaster herewith illustrated is offered by the Wilson Toaster & Specialty Mfg. Company, Minneapolis,

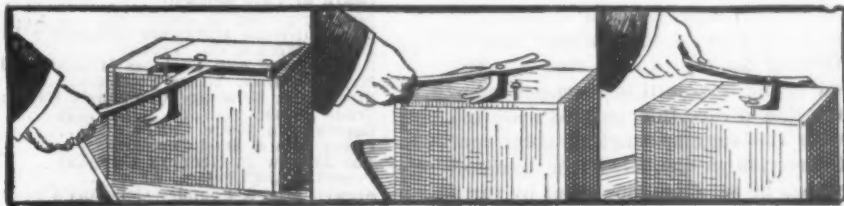


Wilson Bread Toaster.

Minn. The device is arranged to toast four slices of bread at once, and is provided with a solid crumb tray to prevent crumbs falling into the flames of gas, gasoline or oil stoves, so that the crumbs cannot burn and smoke the toast. Having a ventilated top the toaster may be put to a variety of uses, among which are steeping tea or coffee and poaching eggs, while toasting bread, thus economizing fuel.

### The Mellor Box Opener.

A description of a new patented combined box opener, nail puller and hammer, as put on the market by the Kil-



The Mellor Box Opener.

other, similar in every way, for dimes only, both banks registering up to \$10, when they can be opened.

### The Rose Automatic Grinder.

The grinder herewith shown has two revolving emery wheels set at the proper angle. On the outside of each wheel is attached a metal disk. The knife blade being sharpened, guided by the slots in the cap, rests between the wheel and the metal disk, the latter pressing the blade against the wheel. The movement of the blade

born & Bishop Company, New Haven, Conn., was given in our last issue, but one of the cuts to which reference was made in the text was omitted. It is given herewith, and shows how the opener is used to pry open the box, drive down the lid and remove the nails. The tool is drop forged, made of high grade steel, tempered, and the claw is polished. The makers claim that it saves the lids and draws the nails straight. The tool is made in two sizes; No. 1, 14 inches long, weighing 24 ounces, and No. 2, 11 inches long, weighing 14 ounces.

### Bullets for Short Range Practice.

Pursuant to an order from Brigadier-General G. F. Elliott of the United States Marine Corps, Major Rufus H. Lane and other officers of the corps have been conducting a series of experiments with various bullets and charges of different powders for the purpose of securing a satisfactory charge for short range practice. Among the bullets submitted was one de-



Bullet No. 308,245.

signed by the Ideal Mfg. Company of New Haven, Conn., designated as No. 308,245, herewith illustrated. To supply the various Marine Corps stations with a complete outfit for preparing ammunition for short range practice, an order has been given to the Ideal Mfg. Company, New Haven, Conn., for one set for each station.

### Owl Night Marching and Surveying Compass.

Taylor Bros. Company, Rochester, N. Y., and 85 Chambers street, New York, American selling agents for Short & Mason, Hatton Garden and Clerkenwell Road, London, E. C., are offering the patented Owl night marching and surveying compass, here shown. In connection with this compass is a mechanical arrangement by which a given magnetic course or direction can be set accurately to a single degree, without the aid of light in any way. This is accomplished through the medium of a pinion geared into a toothed wheel, each turn of which has a known value; the number of turns to be given to the



Owl Night Marching and Surveying Compass.

pinion being regulated by the angle required to make the desired course. The inner part of the compass case is made to rotate by turning the milled edge ring A. The ring should be turned to the left until it reaches a stop, which brings the black line of direction, painted upon the glass, to coincide with the zero or starting point and opposite the line of direction in the lid of the compass case. Any angle can then be set from this point by turning the handle or lever B, which is geared into the toothed wheel. One complete turn from a given point will move the line of direction four degrees, and each quarter turn one degree. For night use the floating dial is made luminous, except the opening slit of sight line, which appears quite black, owing to its being surrounded by luminous material. For use as a sight compass in daylight a sight line is made in the lid of the case, which being raised to a vertical position, a correct sight can be obtained through the sight hole provided in the bow of the pendant, and angles measured in the usual way. This compass, with graduated aluminum dial and luminous center, is fitted in a bronzed case.

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# Current Hardware Prices.

REVISED JANUARY 19, 1904

**General Goods.**—In the following quotations General Goods that are those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$  @ 33 $\frac{1}{2}$  & 10% signifies that the

price of the goods in question ranges from 33 $\frac{1}{2}$  per cent. discount to 33 $\frac{1}{2}$  and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Abrasives—

Adamite in Carloads: ..... \$ ton \$90@100  
Crat ..... \$ ton \$120@140  
See also Emery.

## Adjusters, Blind—

Domestic, \$ doz. \$3.00 ..... 33 $\frac{1}{2}$   
North's ..... 10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Free Patent ..... 35%  
Tapiro's Perfection ..... 35%

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Arnold and Hammer, Wrought \$8 $\frac{1}{2}$ @\$9 $\frac{1}{2}$   
Buel Patent Trenton ..... \$ 9 $\frac{1}{2}$ @\$9 $\frac{1}{2}$   
Eagle Anvils ..... \$ 7 $\frac{1}{2}$ @\$7 $\frac{1}{2}$   
Hay-Budden, Wrought ..... \$ 9 $\frac{1}{2}$ @\$9 $\frac{1}{2}$   
Horseshoe brand, Wrought ..... \$ 9 $\frac{1}{2}$ @\$9 $\frac{1}{2}$

## Imported—

Peter Wright & Sons ..... \$ 10 $\frac{1}{2}$ @\$10 $\frac{1}{2}$   
Anvil, Vise and Drill—

Millers Falls Co., \$18.00 ..... 15&10%

## Apple Parers—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Hull Bros. Co. .... 30&25

## Augers and Bits—

Com. Double Spur ..... 70¢@10¢@75¢  
Boring Machine Augers ..... 60¢@70¢  
Car Bits, 12-in. twist ..... 60¢@60¢@10¢  
Jennings' Pattern ..... 60¢@10¢@60¢  
Ford's Auger and Car Bits ..... 40¢@5¢  
Foster's Pat. Auger Bits ..... 25¢  
C. E. Jennings & Co.:  
No. 10 ext. lip. R. Jennings' list 25¢@10¢  
No. 30. R. Jennings' list 40¢@75¢@10¢  
Russell Jennings' ..... 25¢@10¢@25¢  
L'Hommedieu Car Bits ..... 15¢@10¢  
Mayhew's Countersink Bits ..... 45¢  
Millers' Falls ..... 60¢@10¢@75¢  
Pugh's Black ..... 30¢  
Pugh's Jennings' Pattern ..... 35¢  
Russell's Auger Bits ..... 60¢  
Russell's Bell Hangers' Bits ..... 50¢@10¢  
Russell's Car Bits, 12-in. twist ..... 60¢  
Wright's Jennings Bits (R. Jennings' list) ..... 50¢  
Bit Stock Drills—  
See Drills, Twist.

## Expansive Bits—

Clark's small, \$1.15 large, \$2.50 ..... 50¢@10¢  
Clark's Pattern, No. 1, \$ doz. \$26 ..... 50¢@10¢  
No. 2, \$18 ..... 50¢@10¢  
Ford's, Clark's Pattern ..... 50¢@10¢@60¢  
C. E. Jennings & Co., Steel's Pat. 35¢@10¢  
Steel's ..... 60¢

## Gimlet Bits—

Common Double Cut, gro. \$2.75@3.00  
German Pattern ..... gro. \$4.00@4.25

## Hollow Augers—

Bonney Pattern, per doz. \$10.00@11.00  
Amos ..... 25¢@10¢  
New Patents ..... 25¢@10¢  
Universal ..... 30¢  
Wood's Universal ..... 35¢

## Ship Augers and Bits—

Ford's ..... 40¢  
Steel's ..... 40¢  
C. E. Jennings & Co.:  
L'Hommedieu's ..... 15¢@10¢  
Watrous' ..... 35¢@10¢

## Awl Hafts, See Hafts, Awl.

## Awls—

Brad Awls:  
Handled ..... gro. \$2.75@3.00  
Unhandled, Shouldered, gro. \$3.50@3.80  
Unhandled, Patent ..... gro. \$6.00@7.00  
Peg Awls:  
Unhandled, Patent ..... gro. \$1.00@1.20  
Unhandled, Shouldered, gro. \$5.50@7.00  
Scratch Awls:  
Handled, Common, gro. \$5.50@6.00  
Handled, Socket, gro. \$11.50@12.00  
Hurdwood ..... 40¢

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First Quality, factory brands ..... \$5.50  
First Quality, Jobbers' brands ..... \$5.10@5.25  
Second Quality ..... \$4.50@4.75  
Axle Grease—See Grease, Axle

## Axles—

Concord, Loose Collar ..... 50¢@54¢  
Concord, Solid Collar ..... 50¢@54¢  
No. 1 Common ..... 40¢@45¢  
No. 1 $\frac{1}{4}$  Com. New Style ..... 44¢@50¢  
No. 2 Solid Collar ..... 44¢@54¢  
Nos. 7, 8, 11 and 12 ..... 60¢@50¢@10¢  
Nos. 13 to 14 ..... 60¢@50¢@10¢  
Nos. 15 to 18 ..... 60¢@10¢@70¢  
Nos. 19 to 22 ..... 60¢@10¢@70¢

## Boxes, Axle—

Common and Concord, not turned, B. 4 $\frac{1}{2}$ @4 $\frac{1}{2}$ @4 $\frac{1}{2}$

Common and Concord, turned, B. 5@5 $\frac{1}{2}$ @5 $\frac{1}{2}$

Half Patent ..... lb. 9@9 $\frac{1}{2}$ @9 $\frac{1}{2}$

## Bait— Fishing—

Headryx:  
A Bait ..... 20%  
B Bait ..... 25%  
Competitor Bait ..... 20&25

## Balances— Sash—

Caldwell new list ..... 50%  
Pullman's ..... 60%

## Spring—

Spring Balances ..... 60¢@80¢@5¢  
Chatillon's:  
Light Spg. Balances ..... 40¢@10¢  
Straight Balances ..... 40¢  
Circular Balances ..... 50¢  
Large Dial ..... 30¢  
Folowee ..... 50%

## Barb Wire—See Wire, Barb.

## Bars— Crow—

Steel Crowbars, 10 to 40 lb. per lb. ..... \$2 $\frac{1}{2}$ @3 $\frac{1}{2}$ @3 $\frac{1}{2}$

## Towel—

No. 10 Ideal, Nickel Plate ..... \$ gro. \$8.50

## Beams, Scale—

Scale Beams, list Jan. 12, '92, 10¢@10¢  
Chatillon's No. 1 ..... 30%  
Chatillon's No. 2 ..... 40%

## Beaters— Egg—

Lighting Chain, \$ gro ..... \$15.00  
National Mfg. Co.:  
No. 1 Dover Family size ..... \$7.00  
No. 2 Dover, Hotel size ..... 14.00  
Taplin Mfg. Co.:  
No. 66 Improved Dover ..... \$6.00  
No. 75 Improved Dover ..... \$5.50  
No. 100 Improved Dover ..... \$7.00  
No. 103 Improved Dover, Tin'd ..... \$8.50  
No. 152 Improved Dover, Hotel, Tin'd ..... \$17.00  
No. 302 Imp'd Dover Tumbler, Tin'd ..... \$8.50  
No. 300 Imp'd Dover Mammoth, \$ doz ..... \$25.00  
Wonder (S. S. & Co.) ..... \$ gro. net, \$9.00

## Bellows—

Blacksmith, Standard List. 75¢@75¢@5¢

## Blacksmiths'—

Inch. 30 35 40 35 40  
Each, \$3.50 3.75 4.25 4.50 5.35 6.15

Extra Length:  
Each, \$4.00 4.55 5.10 5.60 6.10 7.50

## Molders—

Inch. 10 12 14  
Doz. \$3.50 10.00 13.00

## Hand—

Inch. 6 7 8 9 10  
Doz. \$4.25 4.50 5.00 5.50 7.75

## Bells— Cow—

Ordinary goods ..... 75¢@75¢@10¢  
High grade ..... 70¢@10¢@70¢@10¢@5¢  
Jersey ..... 75¢@10¢  
Texas Star ..... 50%

## Door—

Abbe's song ..... 45¢  
Barton Gong ..... 55¢  
Home, R. & E. Mfg. Co.'s ..... 55¢@10¢  
Lever and Pull, Sargent's ..... 30¢@10¢@10¢  
Yankee Gong ..... 35¢

## Hand—

Hand Bells, Polished, Brass ..... 60¢@60¢@10¢

White Metal ..... 60¢  
Nickel Plated ..... 60¢@50¢@5¢  
Stones ..... 60¢@60¢@75¢  
Cone's Globe Hand Bells ..... 30¢@30¢@10¢  
Silver Chime ..... 30¢@30¢@10¢

## Miscellaneous—

Farm Bells ..... lb. 2@2 $\frac{1}{2}$ @4¢  
Steel Alloy Church and School ..... 60¢@60¢@5¢  
American Tube & Stamp Co. Gong, 75¢  
Table Call Bells ..... 50¢@50¢@10¢  
Trip Gong Bells ..... 55¢@10¢@10¢

## Belting— Rubber—

Agricultural (Low Grade) ..... 75¢@75¢@5¢  
Common Standard ..... 70¢@70¢@10¢  
Standard ..... 66¢@70¢  
Extra ..... 60¢@50¢@10¢  
High Grade ..... 50¢@50¢@10¢  
Boston Belting Co.:  
Seamless Stitched Imperial ..... 45¢@5¢  
Boston ..... 50¢@5¢  
Niagara ..... 60¢@5¢

## Leather—

Extra Heavy, Short Lap ..... 60¢@60¢@5¢  
Regular Short Lap 60¢@10¢@60¢@10¢  
Standard ..... 70¢@70¢@5¢  
Light Standard ..... 70¢@10¢  
Cut Leather Lacing ..... 60¢@10¢  
Leather Lacing Sides, per sq. ft. 13¢

## Bench Stops—See Stops, Bench

## Benders and Upsetters, Tire—

Detroit Perfected Tire Bender ..... 40%  
Green River Tire Benders and Upsetters ..... 30%  
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$30.50.

## Bicycle Goods—

John S. Lang's Son's 1903 list:  
Chain ..... 50¢  
Parts ..... 60¢  
Spokes ..... 50¢  
Tubes ..... 60¢

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—  
See Augers and Bits.

## Blocks— Tackle—

Common Wooden ..... 70¢@10¢@75¢@5¢  
Hollow Steel Blocks, with Ford's Patent Sheaves ..... 50¢@10¢  
Lane's Patent Automatic Lock and Anchor ..... 30¢  
Stowell's Novelty, Mal. Iron ..... 50¢@10¢  
Stowell's Self Loading ..... 60%  
See also Machines, Hoisting.

## Boards, Stove—

Zinc, Crystal, &c. .... 30¢@10¢@40¢@10¢

## Bolts—

Carriage, Machine, &c.—  
Common Carriage ..... \$ Phila. Eagle, \$3.00 list May 25, '99 ..... 80¢@50¢@5¢  
Bolt Ends, list Feb. 1, '95, 65¢@5¢@65¢@10¢  
Machine, list Oct. 1, '90 ..... 70¢@10¢@70¢@10¢@5¢  
Machine with C & T. Nuts ..... 60¢@10¢@...%

## Door and Shutter—

Cast Iron Barrel, Round Brass Knob:  
Inch. 3 4 5 6 8  
Per doz. \$0.26 30 39 47 55

Cast Iron Spring Foot:  
Inch. 6 8 10  
Per doz. \$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:  
Inch. 6 8 10  
Per doz. \$0.75 1.05 1.30

Cast Iron Shutter, Brass Knobs:  
Inch. 6 8 10  
Per doz. \$0.57 80 1.00

Wrt Barrel, Jap'd, 75¢@10¢@75¢@10¢@10¢  
Wrought Bronzed, 10¢@5¢@50¢@10¢  
Wrought Flush, B. K., 50¢@10¢@60¢@10¢  
Wrought Shutter ..... 10¢@10¢@10¢@60¢@5¢  
Wrought Square Neck ..... 50¢@50¢@10¢  
Wrought Sunk, Flush ..... 50¢@50¢@10¢  
Ives' Patent Door ..... 60%

## Stove and Plow—

Flow ..... 60¢@60¢@5¢  
Stove ..... 30¢@30¢@10¢

## Tire—

Common ..... 75¢@75¢@10¢  
Norway Iron ..... 30¢@30¢@5¢  
Americac Screw Company:  
Norway Phila., list Oct. 16, '94 ..... 80¢  
Eagle Phila., list Oct. 16, '94 ..... 80¢  
Bay State, list Dec. 23, '99 ..... 72¢@5¢

## Franklin Moore Co.:—

Norway Phila., list Oct. 16, '94 ..... 80¢  
Eagle Phila., list Oct. 16, '94 ..... 80¢  
Eclipse, list Dec. 23, '99 ..... 72¢@5¢  
Russell, Burdall & Ward Bolt & Nut Co.  
Empire, list Dec. 23, '99 ..... 72¢@5¢  
Norway Phila., list Oct. '94 ..... 80¢  
Open Nut Co.:  
Tire Bolts ..... 72¢@5¢

## Borers, Tap—

Borers Tap, Ring, with Handle:  
Inch. 1 $\frac{1}{4}$  1 $\frac{1}{2}$  1 $\frac{3}{4}$  2  
Per doz. \$4.30 5.00 5.75 7.25  
Inch. 2 $\frac{1}{4}$  2 $\frac{1}{2}$  2 $\frac{3}{4}$   
Per Doz. \$3.65 11.50  
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.05; No. 3, \$2.50 each ..... 25%

## Boxes, Mitre—

C. E. Jennings & Co. .... 35¢@10¢  
Langdon ..... 15¢@10¢  
Perfection ..... \$ doz. \$36.00  
Schatts ..... 40%

## Braces—

NOTE.—Most Braces are sold at net prices.  
Common Ball, American, \$1.15@1.25  
Barber's ..... 50¢@10¢@60¢@10¢  
Fray's Genuine Spotted ..... 60¢  
Fray's No. 70 to 120, 81 to 120, 207 to 414 ..... 60¢  
C. E. Jennings & Co. .... 50¢@5¢@10¢  
Mayhew's Batchelor ..... 60¢  
Mayhew's Quick Action Hay Patent, 50¢  
Millers Falls Drill Braces, \$2.00@2.50  
P. S. & W. Co. Peck's Patent 60¢@10¢@65¢

## Brackets—

Wrought Steel ..... 80¢@80¢@5¢  
Bradley's Wire Shelf:  
Full cases ..... 85¢  
Broken cases ..... 80¢@10¢@10¢  
Griffin's Pressed Steel ..... 90¢  
Griffin's Folding Brackets ..... 70¢@10¢  
Stowell's Cast Shelf ..... 75¢  
Stowell's Sink ..... 30%

## Bright Wire Goods—See Wire and Wire Goods.

## Broilers—

Wire Goods Co. .... 75¢@75¢@10%

## Buckets, Well and Fire—

See Pails

## Bucks Saw—

Booster ..... \$ gro. \$32.00

## Bull Rings—See Rings, Bull.

## Butts— Brass—

Wrought list Sept., '96 ..... 30¢@30¢@5¢  
Cast Brass, Tiebout's ..... 50%

## Cast Iron—

Fast Joint, Broad ..... 50¢@50¢@10¢  
Fast Joint, Narrow ..... 50¢@50¢@10¢  
Loose Joint ..... 70¢@5¢@70¢@10¢  
Loose Pin ..... 70¢@5¢@70¢@10¢  
Mayer's Hinges ..... 70¢@5¢@70¢@10¢  
Parliament Butts ..... 70¢@5¢@70¢@10¢

## Wrought Steel—

Table and Back Flaps ..... 75¢  
Narrow and Broad ..... 75¢  
Inside Blind ..... 75¢@10¢  
Loose Pin ..... 75¢  
Loose Pin, Ball and Steeple Tip ..... 80¢@50¢  
Japanned, Ball Tip Butts, 70¢@10¢  
Bronzed Wrt. Nar. and Inside Blind Butts ..... 55¢@10¢

## Cages, Bird—

Hendryx, Brass:  
3000, 5000, 1100 series ..... 55¢  
1200 series ..... 30¢@4¢  
200, 300, 600 and 900 series ..... 40¢@10¢  
Hendryx Bronze:  
700, 800 series ..... 45¢@10¢  
Hendryx Enameled ..... 40¢@10¢

## Calipers—See Compasses.

## Calks, Toe and Heel—

Blunt, 1 prong ..... per lb. 4¢@4¢  
Sharp, 1 prong ..... per lb. 4¢@4¢  
Perkins' Blunt Toe ..... cents, \$ 3.35  
Perkins' Sharp Toe ..... cents, \$ 3.45





## Forks—

Base Discounts Aug. 1, 1899, list:

Hay, 3 time.....	50¢ 10¢ 5%
Boys' & Fish, 3 time.....	60¢ 10¢ 5%
Hay & Boys', 3 time.....	60¢ 10¢ 5%
Hay & Boys', 4 time.....	60¢ 10¢ 5%
Champion Hay.....	60¢ 10¢ 5%
Hay & Header, long 3 time.....	60¢ 10¢ 5%
Header, 4 time.....	60¢ 10¢ 5%
Barley, 4 & 5 time, Steel.....	60¢ 10¢ 5%
Manure, 4 time.....	60¢ 10¢ 5%
Manure, 5 and 6 time.....	60¢ 10¢ 5%
Spading.....	60¢ 10¢ 5%
Potato Digger, 6 time.....	60¢ 10¢ 5%
Sugar Beet.....	60¢ 10¢ 5%
Coke & Coal.....	60¢ 10¢ 5%
Heavy Mill & Steel.....	60¢ 10¢ 5%
Iowa Display Potato.....	60¢ 10¢ 5%
Victor, Hay.....	60¢ 10¢ 5%
Victor, Manure.....	60¢ 10¢ 5%
Victor, Header.....	60¢ 10¢ 5%
Champion, Hay.....	60¢ 10¢ 5%
Champion, Manure.....	60¢ 10¢ 5%
Columbia, Hay.....	60¢ 10¢ 5%
Columbia, Manure.....	60¢ 10¢ 5%
Columbia, Spading.....	60¢ 10¢ 5%
Hawkeye Wood Barley 4 time 4 doz.	\$5.00; 6 time, \$6.00.
W. & C. Potato Digger.....	60¢ 10¢ 5%
Acme Hay.....	60¢ 10¢ 5%
Acme Manure.....	60¢ 10¢ 5%
Iowa Header.....	60¢ 10¢ 5%
Jackson Steel Barley.....	60¢ 10¢ 5%
Kansas Header.....	60¢ 10¢ 5%
W. & C. Favorite Wood Barley 4 time,	4 doz., \$5.00; 6 time, \$6.00

Plated.—See Spoons.

## Fountains, Stock—

Double Dewey.....	4 doz., \$13.00
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## Frames—Saw—

White, Straight Bar, per doz.	75¢ 80¢
Red, Straight Bar, per doz.	\$1.00 75¢
Red, Double Brace, per doz.	\$1.50 1.15

## Freezers Ice Cream—

Qts., 2 3 4 6 8 10	
Best \$1.25 1.65 1.95 2.40 3.20 4.00	
Good \$1.25 1.40 1.60 2.00 2.70 3.60	
Fair \$1.00 1.10 1.30 1.75 2.30 3.20	

## Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

## Fry Pans—See Pans, Fry.

## Fuse—

Temp Fuse.....	Per 1000 Feet.
Cotton Fuse.....	2.50
Single Taped Fuse.....	3.35
Double Taped Fuse.....	4.50
Triple Taped Fuse.....	5.00

## Gates, Molasses and Oil—

Stebbins' Pattern.....30¢ 50¢ 80¢ 10¢ 15¢

## Gauges—

Marking, Mortise, etc.....50¢ 10¢ 50¢ 10¢ 10¢ 5%

Chapin-Stephens Co.:

Marking, Mortise, etc.	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Scholl's Patent.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Door Hangers.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Fulton's Butt Gauge.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Stanley R. & L. Co.'s Butt & Rabbet Gauge.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Wire, Brown & Sharpe's.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Wire, Morse's.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%
Wire P. S. & W. Co.....	50¢ 10¢ 50¢ 10¢ 10¢ 5%

## Gimlets—Single Cut—

Nail, Metal, Assorted, gro. \$1.50 1.50

Spike, Metal, Assorted, gro. \$2.00 3.50

Nail, Wood Handled, Assorted, gro. \$1.75 3.50

Spike, Wood Handled, Assorted, gro. \$1.25 3.50

## Glass, American Window

See Trade Report.

## Classes, Level—

Chapin-Stephens Co. ....60¢ 80¢ 10¢ 10%

Glue—Liquid Fish—

Bottles or Cans, with Brush.....25¢ 50%

Cans (½ pint, pts., qts., ½ gal., gal.).....25¢ 50%

International Glue Co. (Martin's).....40¢ 10¢ 50%

## Grease, Axle—

Common Grade.....gro. \$1.50 5.50

Dixon's Everlasting.....10¢ 2 pails, ea. 35¢

Dixon's Everlasting, in bxs., 3 doz. 1 doz. 1.30; 2 doz. \$3.00

## Grips, Nipple—

Perfect Nipple Grips.....40¢ 10¢ 25¢

## Griddles, Soapstone—

Pike Mfg. Co.....35¢ 39¢ 40¢ 10%

## Grindstones—

Bicycle Emery Grinder.....\$5.50

Pike Mfg. Co. ....\$2.50 3.00

Improved Family Grindstones, per inch, per doz.....\$3.00 3.50

Pike Mower Knife and Tool Grinder, each.....\$6.00

Velox Ball Bearing, mounted, Angle Iron Frames.....each, \$3.25

## Halters and Ties—

Web.....40¢ 25¢

Sisal Rope.....40¢ 50¢

Web's Saddlery Works.....20¢ 25¢

Web and Leather Halters.....70¢

Juste and Manila Rope Halters.....70¢

Juste and Manila and Cotton Rope Ties.....70¢

Sisal Rope Ties.....40¢ 10%

## Hammers—

Handled Hammers—

Bellows' Machinists'.....40¢ 10¢ 40¢ 10¢ 10%

Bellows' Farriers.....40¢ 10¢ 40¢ 10¢ 10%

Knaggs' Tack, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Stow & Wilcox.....40¢ 10¢ 10%

Payette R. Plumb.....\$1.50 1.50

Plumb, A. E. Nall.....\$1.50 1.50

Engineers' and B. S. Hand.....\$1.50 1.50

Machinists' Hammers.....50¢ 10¢ 50¢ 10¢ 5%

## Riveting and Tinner's

Sargent's C. & New List.....40%

## Heavy Hammers and Sledges—

Under 5 lb.....	lb 50¢
5 to 10 lb.....	lb 1.00 75¢ 10¢ 80
Over 10 lb.....	lb 1.50 1.00 1.20
Wilkinson's Smith's.....	95¢ 10¢ 10 lb

## Handles—

Agricultural Tool Handles—

Axe, Pick, etc.....1.50 50¢ 5%

Hoe, Rake, etc.....1.50 50¢ 5%

Fork, Shovel, Spade, etc.....1.50 50¢ 5%

Long Handles.....1.50 50¢ 5%

D Handles.....1.50 50¢ 5%

## Cross-Cut Saw Handles—

Atkins.....40¢ 5%

Champion.....45¢ 45¢ 10%

Disston.....50%

## Mechanics' Tool Handles—

Auger, assorted.....gro. \$2.50 3.75

Bradawl.....gro. \$1.50 1.35

Chisel Handles.....1.50 50¢ 5%

Apple Tanged Firmer, gro. ass'd.....\$1.50 1.50

Hickory Tanged Firmer, gro. ass'd.....\$1.50 1.50

Apple Socket Firmer, gro. ass'd.....\$1.50 1.50

Hickory Socket Firmer, gro. ass'd.....\$1.50 1.50

Hickory Socket Framing, gro. ass'd.....\$1.50 1.50

File, assorted.....gro. \$1.50 1.50

Hammer, Hatchet, Axe, etc.....50%

Hand Saw, Varished, doz.....80¢ 85¢

Not Varished.....65¢ 75¢

Plane Handles:

Jack doz. 30¢; Jack Bolted.....75¢

Fore, doz.....1.50; Fore, Bolted.....90¢

Chapin-Stephens Co.:

Carving Tool.....40¢ 40¢ 10%

Chisel.....50¢ 50¢ 10%

File and Axe.....50¢ 50¢ 10%

Saw and Plane.....40¢ 40¢ 10%

Screw Driver.....40¢ 40¢ 10%

Millers Falls Adj. and Ratchet Auger Handles.....15¢ 10%

Nicholson Simplicity File Handle, gro.....\$0.25 1.50

## Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch.....3 4 5 6 8

Single Dos. \$0.90 1.25 1.60 1.95 2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch.....3 4 5 6 8

Single Dos.....\$1.30 1.55 2.50 3.00

Allith Mfg. Co.:

Reliable No. 1.....per doz. \$12.00

Reliable No. 2.....per doz. \$15.00

Chapin-Stephens Co.:

Friction Spring Butt Co.:

Oscillating.....25%

## Wire Goods Co.

Acme.....	60&10%
Chief.....	70%
Crown.....	70&10%
Czar.....	65%
V. Brace.....	70&10%
Czar Harness.....	50&10%

## Wrought Iron

Box, 6 in., per doz. 1.60	7 in. \$1.25
10 in. \$2.50	
Cotton.....	doz. \$1.05 to 1.25
Wrought Staples, Hooks, &c.	See Wrought Goods.

## Miscellaneous

Busn, Light, doz. \$5.50	Medium \$6.00	Heavy \$6.50
Grass.....Nos. 1 2 3 4		
Best.....	\$1.50	1.75 2.00
Common.....	\$1.30	1.50 1.60
Potato and Manure.....	60&15%	
Wh. flannels.....	lb. 64&6c	
Books and Eyes.....	60&10&10 to 70%	
Malleable Iron.....	70&5 to 70&10%	
Covert Saddlery Works' Self Locking	Gate and Door Hooks.....	60%
Ft. Madison Cut-Easy Corn Hooks.....	doz. \$3.25 net	

Bench Hooks—See Bench Stops.

Corn Hooks—See Knives, Corn.

Horse Nails—See Nails, Horse

Horseshoes—See Shoes, Horse.

Hose Rubber—

Garden Hose, 3/4-inch:	
Competition.....ft. 1/4	5 c
3-ply Standard.....ft. 1/4	7 c
4-ply Standard.....ft. 1/4	8 c
2-ply extra.....ft. 3/4	9 c
4-ply extra.....ft. 10	10 1/2 c
Cotton Garden, 3/4-in., coupled:	
Low Grade.....ft. 6	7 c
Fair quality.....ft. 8	9 c

## Irons—Sad—

From 4 to 10.....lb. 3	14 3/4 c
B. B. Sad Irons.....lb. 3 1/4	3 1/2 c
Chinese Laundry.....lb. 1/4	4 1/2 c
Chinese Sad.....lb. 1/4	4 1/2 c
Mrs. Potts', per set:	
Nos.....50 55 60 65	
Jap'd Tops 71 63 81 78	
Tind Tops 74 71 85 81	
New England Pressing, lb. 3/4	4 c

## Pinking—

Soldering Coppers 2 1/2 and 3.....19 to 20 c

1 1/2 and 2.....21 to 22 c

## Jacks, Wagon—

Covert Mfg. Co.:	
Auto Screw.....	90&5%
Steel.....	45&2%
Covert's Saddlery Works':	
Daisy.....	60&10%
Victor.....	60&10%
Lockport.....	50%
Lane's Steel.....	50&10%

## Kettles—

Brass, Spin, Plain.....200 to 25%

Enamelled and Cast Iron—See Ware, Hollow.

## Knives—

Butcher, Kitchen, &amp;c.—

Poster Bros. Butcher, &c.....	30%
Smith & Hemenway Co.....	40&10%
Wilkinson Shear & Cutlery Co.....	50%
Hay and Straw.....	See Hay Knives.

## Corn—

Withington Acme, 7 doz., \$2.65	Dent, \$2.75
Adl. Serrated, \$2.20	Ser. rated, \$2.10
Yankee No. 1, \$1.50	Yankee No. 2, \$1.15

## Drawing—

Standard List.....	70&5 to 70&10%
Bradley's.....	35&4
C. E. Jennings & Co. Nos. 45, 46.....	60&10%
Jennings & Griffin, No. 51, 52, 60&10&10%	
Swan's.....	70&10&10%
Watson's.....	16&10%
L. & J. J. White.....	20&5 to 25%

## Hay and Straw—

Lightning.....	70 to 75.50 to 7.00
Iwan's Sickle Edge.....	70 to 75.50
Iwan's Serrated.....	70 to 75.50
Maine.....	70 to 75.50

## Mining—

Buffalo.....7 gro. \$13.00

## Miscellaneous—

Farriers.....	doz. \$3.00 to 5.25
Wostenholm's.....	doz. \$3.00 to 3.25

## Knobs—

Base, 2 1/2-inch, Birch, or Maple	
Rubber tip, gro.....	\$1.10 to 1.15
Carriage, Jap. all sizes.....	gro. 10 to 15 c
Door, Mineral.....	doz. 65 to 70 c
Door, Por. Jap'd.....	doz. 70 to 75 c
Door, Por. Nickel.....	doz. 82.05 to 2.15
Barley's Wood Door, Shutter, &c.....	10%
Picture, Sargent's.....	60&10&10%

## Lacing Leather—

See Belting Leather—

## Ladders, Step, Etc.—

Lane's Store.....25%

Myers Noiseless Store Ladders.....30%

## Ladies—Melting—

L. &amp; G. Mfg. Co., Low List.....25%

Reading.....60%

Sargent's.....45&amp;10%

## Lanterns—Tubular—

Regular Tubular No. 0, doz.	\$4.35 to 4.75
Left Tubular, No. 0, doz.	\$4.75 to 5.25
Hinge Tubular, No. 0, doz.	\$4.75 to 5.25
Other Styles.....	40 to 100 to 100%

## Bull's Eye Police—

No. 1 2 3/4 inch.....	\$2.50 to 2.75
No. 2, 3 inch.....	\$2.75 to 3.00

## Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....	50%
Stowell's Badger, Cast Iron.....	50%

## Latches—

Thumb—

Roggin's Latches, with screw, doz. \$5.00 to 5.50

## Leaders, Cattle—

Small.....doz. 55c; large, 60c

Covert Mfg. Co.....55&amp;25%

## Lifters, Transom—

R &amp; E.....33&amp;45%

## Lines—

Wire Clothes, Nos. 18 19 20

100 feet.....\$2.30 2.00 1.65

75 feet.....1.80 1.70 1.30

Samson Cordage Works:

Solid Braided Chalk, No. 0 to 3.....10%

Silver Lake Braided Chalk, No. 0, \$6.00;

No. 1 \$6.50; No. 2, \$7.00; No. 3, \$7.50

per gr.....30%

Anniston Waterproof Clothes, 50 ft., 7

gro.; \$25.00; Gilt Edge, \$24.00; Air Line

\$24.00; Acme, \$19.00; Alabama, \$17.00;

Empire, \$18.00; Advance, \$15.00; Ori-

ole, \$22.00; Albermarle, \$15.00; Eclair, \$18.50;

Chicago, \$12.50; Standard, \$11.00;

Columbia, \$9.50.

## Locks—Cabinet—

Cabinet Locks.....3 1/4 to 3 1/2 to 3 3/4

Door Locks, Latches, &amp;c.—

[Net prices are very often made on

these goods.]

Reading Hardware Co.....50%

R. &amp; E. Mfg. Co.....40%

Sargent &amp; Co.....40&amp;10%

Stowell's Steel Door Latches.....50%

## Elevator—

Stowell's.....50%

## Padlocks—

Wrought Iron.....75 to 100 to 80 to 5%

R. &amp; E. Mfg. Co. Wrt. Steel and Brass.....75 to 100 to 5%

## Sash, &amp;c.—

Ives' Patent.....32&amp;45%

Bronze and Brass.....32&amp;45%

Crescent.....32&amp;45%

Iron.....32&amp;45%

Wrought Bronze and Brass.....32&amp;45%

Wrought Steel.....32&amp;45%

Reading.....32&amp;45%

## Machines—Boring—

Com., Upright, Without Augers.....\$2.00

Com. An. Upr., Without Augers.....\$2.25

Without Augers.

R. &amp; E. Mfg. Co.: Upright, Angular.

Improved No. 3, \$4.25 No. 2, \$5.00

Improved No. 4, 3.75 No. 3, 3.38

Jennings' No. 4, 3.15 No. 1, 3.50

Miller's Falls.....2.75

Snell's, Rice's Pat. 2.50 2.75

## Corking—

Reisinger Invaluable Hand Power.....7 doz. \$48.00

## Fence—

Williams' Fence Machines.....each, \$5.50

## Hoisting—

Moore's Anti-Friction Differential Pul-

ley Block.....30%

Moore's Hand Hoist, with Lock Brake.....20%

## Ice Cutting—

Chandler's.....15&amp;10%

## Washing—

Boss Washing Machine Co.: Per doz.

Boss No. 1; Boss Rotary.....\$57.00

Boss No. 7; Diets Rotary.....\$60.00

Champion Rotary; Banner No. 1.....\$54.00

Standard Champion No. 1.....\$48.00

Standard Perfection.....\$36.00

Cinti Square Western.....\$30.00

Unedea American, Round.....\$29.00

## Mallets—

Hickory.....45&amp;50%

Lignumvitte.....45&amp;50%

Tinnars', Hickory and Applewood.....60&amp;55c

## Mats—Door—

Elastic Steel (W. G. Co.).....10%

## Mattocks—

See Picks and Mattocks.

## Milk Cans—See Cans, Milk

## Mills—Coffee, etc.—

Raterprae Mfg. Co.....\$5 to 80%

National, list Jan. 1, 1902.....30%

Parker's Columbia &amp; Victoria.....50&amp;10 to 60%

Parker's Box and Side.....50&amp;10 to 60%

Sun, No. 1060, 1 1/2 mill.....7 doz. \$3.00

Swift, Lane Bros Co.....30%

## Mowers, Lawn—

Net prices are generally quoted.

Cheap.....all sizes, \$1.90 to 1.95

Good.....all sizes, \$2.25 to 3.50

10 12 14 16-inch

High Grade 4.25 4.50 4.75 5.00

Continental.....60&amp;5%

Great American.....70%

Great American Ball Bearing, new list.....70%

Quaker City.....60%

Pennsylvania, Jr., Ball Bearing.....60%

Pennsylvania Golf.....50%

Pennsylvania Horse.....50%

Pennsylvania Pony.....40&amp;5%

Philadelphia:

Styles M. S. C. K. T.....70&amp;55%

Style A, all Steel.....60&amp;55%

Style E, High Wheel.....70&amp;10&amp;2%

Drexel and Gold Coin, low list.....40&amp;25%

## Nails—

Cut and Wire. See Trade Report.

Wire Nails and Brads, Papered.

List July 20, 1899. 85&amp;10 to 85&amp;10 to 10%

Hungarian, Finishing, Upholster-

ers', &amp;c. See Tasks.

## Horse—

Nos. 6 7 8 9 10

A. C.....25 33 21 31.....40&amp;54

A. S. &amp; B.....25 33 21 31.....50&amp;10%

C. B. K.....25 33 21 31.....50%

Champion.....25 33 21 31.....50%

Clinton.....19 17 15 14 13.....30&amp;10&amp;5%

Maud S.....25 33 21 31.....50%

Putnam.....23 21 20 19 18.....33&amp;4%

New.....19 18 17 16 15.....10&amp;10%

American, No. 5 to 10, 7 doz. \$4.95

Jobbers' special brands, per lb. 8 to 9 1/4 c

## Picture—

Brass Head, 1 1/2 2 2 1/2 3 3 1/2 in.

Por. Head.....45 60 70 95 100 gro.

1.10 1.10 1.10 1.10 1.10 gro.

## Nippers, See Pliers and Nippers.

## Nuts—

Cold Punched: Off Hat.

Mfrs. or U. S. Standard.

Square, plain.....\$4.90 to 5.00

Hexagon, plain.....\$5.30 to 5.50

Square, C. T. &amp; E.....\$5.10 to 5.20

Hexagon, C. T. &amp; E.....\$5.70 to 4.00

## Hot Pressed:

Mfrs., U. S. or Nar. Gauge Stan'd.

Square Blank.....\$5.80 to 5.90

Hexagon Blank.....\$6.10 to 6.50

Square Tapped.....\$5.60 to 5.70

Hexagon Tapped.....\$6.20 to 6.50

## Oakum—

Best or Government.....lb. 6 1/4 c

Navy.....lb. 4 1/4 c

U. S. Navy.....lb. 5 1/4 c

Plumbers' Spun Oakum.....2 1/4 c

In carload lots 1 1/4 lb. off f.o.b. New

## York.

## Oil Tanks—See Tanks, Oil.

## Oilers—

Brass and Copper.....50&amp;10%

Tin or Steel.....70&amp;10 to 75%

Zinc.....65&amp;10%

Chase or Paragon:

Brass and Copper.....45&amp;10 to 50%

Tin or Steel.....75 to 76 to 10%

Zinc.....65%

Malleable, Hammers' Improved, No. 1.

\$3.00; No. 2, \$4; No. 3, \$4.40 7 doz. 20%

Malleable, Hammers' Old Pattern.

same list.....50&amp;10%

American Tube &amp; Stamping Co.:

Spring Bottom Cans.....70&amp;10%

Railroad Oilers etc.....60&amp;10%

## Openers—Can—

French.....doz. 55c

Iron Handle.....doz. 35 to 40 c

Sprague, Iron Handle, per doz. 35 to 40 c

Sardine Scissors.....doz. \$1.75 to \$3.00

Marvel.....per doz. \$1.25

National.....50%

Stowell's sprague.....per doz. 35 to 45 c

Tip Top.....per doz. \$0.75

Triumph Shear.....7 gro. \$9.00

## Egg—

Nickel Plate.....per doz. \$2.00

Silver Plate.....per doz. \$4.00

## Packing—

Asbestos Packing, Wick and Rope,

1 1/4 to 1 1/2 lb.

## Rubber—



Stanley's Duplex..... 20@20.10&10.15  
Woods' Extension..... 39.45

**Poachers, Egg—**

Buffalo Steam Egg Poachers, No. 3, No. 1, \$4.00; No. 2, \$3.00; No. 3, \$1.00; No. 4, \$1.20..... 50.4

**Points, Claziers—**

Bulk and 1 lb. papers..... lb. 6.4c  
1/2 lb. papers..... lb. 6.4c  
1/4 lb. papers..... lb. 6.4c

**Pokes, Animal—**

Fr. Madison Hawkeye..... doz. \$3.25  
Fr. Madison Western..... doz. \$4.00

**Police Goods—**

Manufacturers' Lists..... 25@25.55  
Tower's..... 25

**Polish—Metal—**

Prestoline Liquid, No. 1 (1/2 pt.), doz. \$3.00; No. 2 (1 qt.), doz. \$3.00  
Prestoline Paste..... 40&10.15  
George W. Williams..... 40&10.15

U. S. Metal Polish Paste, 3 oz. boxes, doz. \$0.50; 1 lb. boxes, doz. \$4.50; 1/2 lb. boxes, doz. \$1.25; 1 lb. boxes, doz. \$2.25  
U. S. Liquid, 8 oz. cans, doz. \$1.25; 1 lb. cans, doz. \$2.00

Barkeepers' Friend Metal Polish, doz. \$1.75; 1 lb. cans, doz. \$18.00  
Wynn's White Silk, 1/2 pt. cans, doz. \$2.00

**Stove—**

Black Eagle Benzine Paste, 5 lb. cans, doz. \$10.00  
Black Eagle Liquid, 1/2 pt. cans, doz. \$7.50  
Black Jack Paste, 1 lb. cans, doz. \$3.00  
Black Kid Paste, 1 lb. cans, doz. \$3.00  
Ladd's Black Beauty, gr. \$10.00..... 50.5  
Joseph Dixon's, gr. \$5.75..... 10.5  
Dixon's Plumbago..... gr. \$2.50  
Fireside..... gr. \$2.50  
Gem, gr. \$4.50..... 10.5  
Japanese..... gr. \$3.50  
Jet Black..... gr. \$3.50  
Peerless Iron Enamel 10 oz. cans, doz. \$1.50

Wynn's:  
Black Silk, 5 lb. pail..... each 70.5  
Black Silk, 1/2 pt. cans, doz. \$1.00  
Black Silk, 1 lb. cans, doz. \$1.00  
Black Silk, 1/2 pt. liq. doz. \$1.00

**Poppers, Corn—**

1 qt., Square..... gro. \$9.00  
1 qt., Round..... gro. \$10.00  
1/2 qt., Square..... gro. 11.00  
1 qt., Square..... gro. 13.00

**Post Hole and Tree Augers and Diggers—**

See also Diggers, Post Hole, &c.

**Posts, Steel—**

Steel Fence Posts, each 5 ft., 4 1/2; 6 ft., 4 1/2; 6 1/2 ft., 4 1/2  
Steel Hitching Posts, each..... \$1.50

**Potato Parers—**

See Parers, Potato.

**Pots—Glue—**

Enameled..... 10.5  
Tinned..... 5.5

**Powder—**

In Cans:  
Duck, 1 lb. each..... 4.50  
Fine Sporting, 1 lb. each..... 7.50  
Rifle, 1/2 lb. each..... 1.50  
Rifle, 1 lb. each..... 2.50

King's Semi-Smokeless:  
Keg (25 lb. bulk)..... \$8.50  
Half Keg (12 1/2 lb. bulk)..... \$4.50  
Quarter Keg (6 1/4 lb. bulk)..... \$2.50  
Case 24 (1 lb. cans bulk)..... \$4.50  
Half case (1 lb. cans bulk)..... \$4.50

King's Smokeless: Shot Gun Rifle  
Keg (25 lb. bulk)..... \$12.00  
Half Keg (12 1/2 lb. bulk)..... \$6.00  
Quarter Keg (6 1/4 lb. bulk)..... \$3.50  
Case 24 (1 lb. cans bulk)..... \$4.00  
Half case (1 lb. cans bulk)..... \$4.00  
Robins Hood Smokeless Shot Gun..... 50.20

**Presses—**

Fruit and Jelly—  
Enterprise Mfg. Co..... 30@25.5  
Sensibite..... 35.5  
2 qt., doz. \$4.00; 1 qt., doz. \$3.00 each.

**Seal Presses—**

Morrill's No. 1, per doz. \$20.00..... 50.5

**Pruning Hooks and Shears—See Shears.****Pullers, Nail—**

Cyclones..... 50.5  
Dudley Improved Nail Puller..... 30.5  
Miller's Falls, No. 3, per doz. \$12.00..... 39.45

Pearson No. 1, Cyclone Spike Puller, each \$30.00..... 50.5  
Pelican, doz. \$9.00..... 40.10  
Scranton Case Lots:  
No. 2 B (small)..... \$5.00  
Smith & Hemenway Co.:  
Ajax..... 60.5  
Diamond B. No. 2, case lots, doz. \$4.00  
Diamond B. No. 3, case lots, doz. \$5.50  
Eureka..... 118.5  
Grant, No. 1, doz. \$18.5; No. 2, \$14.50  
No. 2, \$15.5  
Yankee..... 60.5

**Pulleys—Single Wheel—**

Inch..... 2 1/4 3  
Awtine, doz. \$0.55; 3 1/2 1.15  
Hay Fork, Swivel or Solid Eye, doz., 4 in., \$1.15; 5 in., \$1.40

Inch..... 2 1/4 3  
Hot House, doz. \$0.70; 3 1/2 1.25  
Inch..... 1 1/4 1 1/4 3  
Screw, doz. \$0.16; 1 1/2 30  
Inch..... 1 1/4 2 1/4 3 1/4  
Slide, doz. \$0.30; 4 1/2 5.5 6.5  
Inch..... 1 1/4 1 1/4 2 1/4  
Tackle, doz. \$0.30; 3 1/2 5.5 1.00

Stowell's:  
Ceiling or End, Anti-Friction, 60&10.5  
Dumb Waiter, Anti-Friction, 60&10.5  
Electric Light..... 60.5  
Slide, Anti-Friction..... 60&10.5

**Sash Pulleys—**

Common Frame, Square or Round End, per doz., 1 1/4 and 2 in., 16@19c  
Auger, Mortise, no Face Plate, per doz., 1 1/4 and 2 in., 16@19c

Auger Mortise, with Face Plate, per doz., 1 1/4 and 2 in., 16@19c  
Aome..... 13(in.), 16; 2 in., 19  
Common Sense, 1 1/4 in..... doz. 1.85; 2 in., 2.05

Grand-All-Steel, Nos. 3 and 7 1/2 in., doz. 50.5  
Ideal..... 1 1/4 in., 16; 2 in., 19  
Niagara..... 1 1/4 in., 14; 2 in., 16  
No. 26, Troy..... 1 1/4 in., 14; 2 in., 16  
Star..... 1 1/4 in., 16; 2 in., 19

Tackle Blocks—See Blocks.

**Pumps—**

Cistern..... 60@6.10  
Pitcher Spout..... 30@50.5  
Wood..... 50@50.10

Pump Leathers—  
Plunger and Lever Valve—Per gro.:  
Inch..... 2 1/4 2 1/2 3 1/4 3 1/2 4  
Inch..... 3 3/4 3 1/2 3 1/4 3 1/2 4

Plunger Cup Leathers—Per 100:  
Inch..... 2 1/4 3 3 1/4 4  
Inch..... 3 3/4 3 1/2 3 1/4 3 1/2 4

Barnes Dbl. Acting (low list)..... 50&10.5  
Contractors' Rubber Diaphragm No. 2, 1, & 1 1/2 Block Co..... \$16.90  
Daisy Spray Pump, doz. \$7.20  
Flint & Walling's Fast Mail (low list)..... 50.5  
Flint & Walling's Pitcher Spout..... 50.5  
National Specialty Mfg. Co., Measur- ing \$4.00..... 30.5  
Mechanical Sprayer..... \$7.30  
Myer's Pumps, low list..... 50.5  
Myers' Power Pumps..... 30.5  
Myers' Spray Pumps..... 50.5

Punches—  
Saddlers' or Drive, good, doz. 65@70c  
Spring, single tube, good quality..... \$1.75@2.00

Revolving (1 tubes)..... doz. \$3.50@3.75  
Bemis & Call Co.'s Cast Steel Drive..... 50.5  
Bemis & Call Co.'s Check..... 50.5  
Benard Spring Belt Punches..... \$3.35  
Lodi Spring Belt Punches..... 50.5  
Morrill's No. 1 (A.B.C.), doz. \$15.00; No. 2, doz. \$22.50..... 50.5  
Hercules, each \$7.50..... 50.5  
Niagara Hollow Punches..... 40.5  
Niagara Solid Punches..... 55&10.5  
Paragon Spring Belt Punches..... 40.5  
Steel Screw, B & K Mfg. Co..... 40.5  
Timbers' Hollow, P. S. & W. Co., 35&35.5  
Timbers' Solid, P. S. & W. Co., doz. \$1.44..... 60.5

Rail—Barn Door, &c.—  
Cast Iron, Barn Door, Flange Screw Holes for Rd. Groove Wheels:  
1/2 3/4 1 in. 1 1/4 1 1/2 1 3/4 2 in. 2 1/2 3 in. 3 1/2 4 in. 5 in. 6 in. 8 in. 10 in. 12 in. 14 in. 16 in. 18 in. 20 in. 22 in. 24 in. 26 in. 28 in. 30 in. 32 in. 34 in. 36 in. 38 in. 40 in. 42 in. 44 in. 46 in. 48 in. 50 in. 52 in. 54 in. 56 in. 58 in. 60 in. 62 in. 64 in. 66 in. 68 in. 70 in. 72 in. 74 in. 76 in. 78 in. 80 in. 82 in. 84 in. 86 in. 88 in. 90 in. 92 in. 94 in. 96 in. 98 in. 100 in. 102 in. 104 in. 106 in. 108 in. 110 in. 112 in. 114 in. 116 in. 118 in. 120 in. 122 in. 124 in. 126 in. 128 in. 130 in. 132 in. 134 in. 136 in. 138 in. 140 in. 142 in. 144 in. 146 in. 148 in. 150 in. 152 in. 154 in. 156 in. 158 in. 160 in. 162 in. 164 in. 166 in. 168 in. 170 in. 172 in. 174 in. 176 in. 178 in. 180 in. 182 in. 184 in. 186 in. 188 in. 190 in. 192 in. 194 in. 196 in. 198 in. 200 in. 202 in. 204 in. 206 in. 208 in. 210 in. 212 in. 214 in. 216 in. 218 in. 220 in. 222 in. 224 in. 226 in. 228 in. 230 in. 232 in. 234 in. 236 in. 238 in. 240 in. 242 in. 244 in. 246 in. 248 in. 250 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in. 2112 in. 2114 in. 2116 in. 2118 in. 2120 in. 2122 in. 2124 in. 2126 in. 2128 in. 2130 in. 2132 in. 2134 in. 2136 in. 2138 in. 2140 in. 2142 in. 2144 in. 2146 in. 2148 in. 2150 in. 2152 in. 2154 in. 2156 in. 2158 in. 2160 in. 2162 in. 2164 in. 2166 in. 2168 in. 2170 in. 2172 in. 2174 in. 2176 in. 2178 in. 2180 in. 2182 in. 2184 in. 2186 in. 2188 in. 2190 in. 2192 in. 2194 in. 2196 in. 2198 in. 2200 in. 2202 in. 2204 in. 2206 in. 2208 in. 2210 in. 2212 in. 2214 in. 2216 in. 2218 in. 2220 in. 2222 in. 2224 in. 2226 in. 2228 in. 2230 in. 2232 in. 2234 in. 2236 in. 2238 in. 2240 in. 2242 in. 2244 in. 2246 in. 2248 in. 2250 in. 2252 in. 2254 in. 2256 in. 2258 in. 2260 in. 2262 in. 2264 in. 2266 in. 2268 in. 2270 in. 2272 in. 2274 in. 2276 in. 2278 in. 2280 in. 2282 in. 228

**Screws—Bench and Hand—**

Bench, Iron, doz. 1 in., \$2.50 @ 2.75 :  
 1 1/2, \$3.00 @ 3.25 : 1 3/4, \$3.50 @ 3.75 :  
 Bench, Wood, Beech, doz. 3/4, 50 @ 55 :  
 Hand, Wood, 30 @ 30 :  
 R. Mills Mfg. Co., Hand, 30 @ 30 :  
 Chapin-Stephens Co., Hand, 30 @ 30 :  
**Coach, Lag and Hand Rail—**  
 Lag, Common Point, list Oct. 1, 93 :  
 Coach and Lag, Gimlet Point, list Oct. 1, 93 :  
 Hand Rail, list Jan. 1, '94, 60 @ 10 :  
**Jack Screws—**  
 Standard List, 75 @ 10 @ 80 @ 50 :  
 Millers Falls, Roller, 50 @ 10 @ 10 :  
 P. S. & W., 50 @ 10 @ 10 :  
 Sargent, 70 @ 10 @ 10 :  
**Machine—**  
 List Jan. 1, '93 :  
 Flat or Round Head, Iron, 50 @ 50 @ 10 :  
 Flat or Round Head, Brass, 50 @ 50 @ 10 :  
**Set and Cap—**  
 Set (Iron or Steel), 70 @ 10 @ 5 :  
 Sq. Hd. Cap, 65 @ 10 @ 5 :  
 Hex. Hd. Cap, 65 @ 10 @ 5 :  
 Rd. or Filler Hd. Cap, 60 @ 10 @ 5 :  
**Wood—**  
 List July 23, 1903 :  
 Manufacturers' printed discounts :  
 Flat Head, Iron, 87 1/2 @ 10 :  
 Round Head, Iron, 85 @ 10 :  
 Flat Head, Brass, 85 @ 10 :  
 Round Head, Brass, 80 @ 10 :  
 Flat Head, Bronze, 77 1/2 @ 10 :  
 Round Head, Bronze, 75 @ 10 :  
 Drive Screws, 87 1/2 @ 10 :  
**Scroll Saws—See Saws, Scroll.**  
**Scythes—** Per doz.  
 Clipper Pattern, Grass, \$4.25 @ \$5.00 :  
 Full Polished Clipper, \$4.75 @ \$5.50 :  
 Grain, \$7.00 @ \$7.50 :  
 Clipper, Grain, \$7.75 @ \$8.25 :  
 Weed and Bush, \$4.50 @ \$5.00 :  
**Seeders—Raisin—**  
 Enterprise, 25 @ 30 :  
**Sets—Axl and Tool—**  
 Brad Axl and Tool Sets :  
 Wood Hdl., 10 Axl. doz. \$2.00 @ 2.25 :  
 Wood Hdl., 14 Axl., 6 Tools, doz. \$2.50 @ 2.80 :  
 Alken's Seta, Axl and Tools :  
 No. 30, 9 doz. \$10.00 : 50 @ 10 @ 10 :  
 Fray's Adj. Tool Hdl's, Nos. 1, 1 1/2, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 :  
 C. E. Jennings & Co.'s Model Tool Holders, 50 @ 10 :  
 Millers Falls Adj. Tool Hdl's, No. 1, 1 1/2, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 :  
 Stanley Excelsior :  
 No. 1 \$7.50 : No. 2 \$4.00 : No. 3, \$5.50 : 30 @ 30 @ 10 @ 10 :  
**Garden Tool Sets—**  
 Ft. Madison, Three Piece, Hoe, Rake and Shovel, 9 doz. sets, \$9.00 :  
**Nail—**  
 Square, per gro. \$2.25 @ 2.50 :  
 Round, Blk. and Pol., assorted, gro. \$1.50 @ 2.00 :  
 Octagon, per gro. \$1.50 @ 2.00 :  
 Buck Brothers, 37 1/2 @ 10 :  
 Cannon's Diamond Point, \$8.12 @ 8.50 :  
 Mayhew's, per gro. \$2.00 :  
 Snell's Corrugated, Cup Pt., per gro. \$7.50 :  
 Snell's Knurled, Cup Pt., per gro. \$7.50 :  
**Rivet—**  
 Regular list, 70 @ 10 @ 75 :  
**Saw—**  
 Alken's :  
 Genuine, 50 @ 10 :  
 Imitation, 50 @ 10 :  
 Atkin's :  
 Criterion, 40 @ 5 :  
 Adjustable, 40 @ 5 :  
 Bemis & Call Co.'s :  
 Cross Cut, 30 @ 30 :  
 Hammer, new Pat., 45 @ 5 :  
 Spring Hammer, 30 @ 30 :  
 Disston's Star and Monarch, 25 @ 25 :  
 Morrill's No. 1, \$15.00 : 50 @ 50 :  
 Nos. 3 and 4, Cross Cut, \$20.00 : 50 @ 50 :  
 No. 5, Mill, \$30.00 : 50 @ 50 :  
 No. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 :  
 Special, \$16.25 : 30 @ 30 :  
 Giant Royal, Cross Cut, 40 @ 40 :  
 Royal Hand, 40 @ 40 :  
 Talbot Positive, 40 @ 40 :  
**Shaving—**  
 Fox Shaving Seta, No. 30, per doz. \$24.00 net :  
**Sharpeners, Knife—**  
 Chicago Wheel & Mfg. Co., 65 @ 65 :  
**Shaves Spoke—**  
 Iron, doz. \$1.00 @ 1.15 :  
 Wood, doz. \$1.75 @ 2.00 :  
 Bailey's (Stanley R. & L. Co.), 50 @ 30 @ 10 @ 10 :  
 Chapin-Stephens Co., 50 @ 30 @ 10 @ 10 :  
 Goodell's, 50 @ 30 :  
 Wood's F1 and F2, 50 @ 50 :  
**Shears—**  
 Cast Iron, 7 8 9 in.  
 Best, \$16.00 15.00 20.00 gro.  
 Good, \$13.00 15.00 17.00 gro.  
 Cheap, \$5.00 6.00 7.00 gro.  
 Straight Trimmers, etc. :  
 Best quality, Jap., 70 @ 70 @ 10 :  
 Nickel, 60 @ 60 @ 10 :  
 Fair qual. Jap., 50 @ 50 @ 10 :  
 Nickel, 40 @ 40 @ 10 :  
 Tailors' Shears, 40 @ 40 :  
 Acme Cast Shears, 40 @ 40 :  
 H. Inisch's Tailors' Shears, 40 @ 40 :  
 Wilkinson's Hedge, 1900 list 45 :  
 Wilkinson's Branch, Lawn and Border, 40 @ 40 :  
 Wilkinson's Sheep, 1900 list 35 :  
**Tinners' Snips—**  
 Steel Blades, 20 @ 25 @ 30 @ 10 :  
 Steel Laid Blades, 40 @ 10 @ 50 :  
 Forged Handles, Steel Blades, Berlin, 40 @ 40 @ 10 :  
 H. Inisch's Snips, 40 @ 40 :  
 Jennings & Griffin Mfg. Co.'s, 40 @ 40 :  
 Niagara Snips, 40 @ 40 :  
 P. S. & W. Co., 40 @ 40 :  
 Triumph Pipe Shears, 40 @ 40 :  
**Pruning Shears and Tools—**  
 Cronk's Grape Shears, 33 1/2 @ 35 :  
 Cronk's Pruning Shears, 33 1/2 @ 35 :  
 Disston's Combined Pruning Hook and Saw, 25 @ 25 :  
 Disston's Pruning Hook, 25 @ 25 :  
 John T. Henry Mfg. Co. :  
 Pruning Shears, all grades, 40 @ 40 @ 5 :  
 Orange Shears, 50 @ 10 @ 50 @ 20 :  
 Grape Pruners, 40 @ 10 @ 50 :  
 Tree Pruners, 75 @ 75 :  
 P. S. & W. Co., 33 1/2 @ 35 :  
**Sheaves—Sliding Door—**  
 Stowell's Anti-Friction, 50 @ 50 :  
 Patent Roller Hatfield's, Sargent's list, 70 @ 10 :  
 Reading, 50 @ 50 :  
 R. & E. list, 50 @ 50 :  
 Wrightsville Hatfield Pattern, 50 @ 50 :  
**Sliding Shutter—**  
 Reading list, 50 @ 50 :  
 R. & E. list, 33 1/2 @ 35 :  
 Sargent's list, 50 @ 10 :  
**Shells—Shells, Empty—**  
 Brass Shells, Empty :  
 First quality, all gauges, 60 @ 55 :  
 Climax, Club, Rival, 10 and 12 gauge, 65 @ 55 :  
 Paper Shells, Empty :  
 Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge, 25 @ 25 :  
 Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge, 30 @ 30 :  
 Climax, Union, League, New Rival 10 and 12 gauge, 25 @ 25 :  
 Climax, Union League, New Rival, 14, 16 and 20 gauge (Pigson list), 30 @ 30 :  
 Export, Metal Lined and Export, 10, 12, 16 and 20 gauge, 38 1/2 @ 35 :  
 Robin Hood, Low Brass, 20 @ 10 :  
 Robin Hood, High Brass, 20 @ 10 :  
**Shells, Loaded—**  
 Loaded with Black Powder, 40 @ 40 :  
 Loaded with Smokeless Powder, medium grade, 40 @ 40 :  
 Loaded with Smokeless Powder, high grade, 40 @ 10 @ 10 :  
 Robin Hood smokeless Powder :  
 Robin Hood, Low Brass, 50 @ 50 :  
 Corneils, High Brass, 50 @ 10 @ 5 :  
**Shoes Horse, Mule, &c.—**  
 F. O. B., Pittsburgh :  
 Iron, per keg \$3.35 :  
 Steel, per keg \$3.60 :  
 Burden's, all sizes, 9 keg, \$3.90 :  
**Shot—**  
 Drop, up to B, 25-lb. bag, \$1.60 :  
 Drop, B and larger, per 25-lb. bag, \$1.85 :  
 Buck, 25-lb. bag, \$1.85 :  
 Chilled, 25-lb. bag, \$1.85 :  
**Shovels and Spades—**  
 Association List, Nov. 15, 1903, 40 @ 40 :  
**Sieves and Sifters—**  
 Hunter's Imitation, gro. \$10.50 @ 11.00 :  
 Buffalo Metallic Blued, S. S. Co., 14 @ 14 : 16 @ 16 : 18 @ 18 :  
 \$13.20 \$13.50 \$14.40 :  
 National Mfg. Co. :  
 Victor, 10 @ 10 :  
 No Name, 10 @ 10 :  
 Shaker (Barier's Pat.) Flour Sifters, 90 @ 90 :  
 9 doz., \$3.00 : 90 @ 90 :  
**Sieves, Tin Rim—**  
 Per dozen :  
 Mesh, 15 16 18 20 :  
 Black, full size, \$1.20 1.25 1.30 1.35 :  
 Plated, full size, \$1.30 1.35 1.40 1.45 :  
 Black, scant, \$6.35 6.40 1.00 1.05 :  
**Sieves, Wooden Rim—**  
 Nested, 10, 11 and 12 Inch :  
 Mesh 28, Nested, doz., \$0.90 @ 0.95 :  
 Mesh 30, Nested, doz., 1.00 @ 1.05 :  
 Mesh 34, Nested, doz., 1.30 @ 1.40 :  
**Sinks—**  
 Cast Iron—  
 Standard list, 60 @ 60 @ 10 :  
 NOTE—There is not entire uniformity lists used by jobbers.  
**Sinks, Wagon—**  
 Cast Iron, 70 @ 70 @ 10 :  
 Steel, 40 @ 40 @ 10 :  
**Slates, School—**  
 Factory Shipments.  
 "D" Slates, 40 @ 10 :  
 Noiseless Slates, 60 @ 50 :  
**Slaw Cutters—See Cutters.**  
**Slicers, Vegetable—**  
 Sterling No. 10, \$2.00 : 33 1/2 @ 35 :  
**Snaps, Harness—**  
 German, 40 @ 40 @ 10 :  
 Covert Mfg. Co. :  
 High Grade, 30 @ 30 @ 25 :  
 Jockey, 30 @ 30 @ 10 :  
 Trojan, 45 @ 45 :  
 Yankee, 30 @ 30 @ 25 :  
 Yankee, Roller, 30 @ 30 @ 25 :  
 Covert's Saddlery Works :  
 Crown, 60 @ 60 :  
 German, 60 @ 60 :  
 Model, 60 @ 60 :  
 Triumph, 60 @ 60 :  
 Oneida Community, 60 @ 60 :  
 Solid Swivel, 60 @ 60 :  
 Sargent's Patent Guarded, 60 @ 10 :  
**Snaths—**  
 Scythe, 45 @ 45 :  
**Snips, Tinner's—See Shears.**  
**Spoons and Forks—**  
**Silver Plated—**  
 Good Quality, 50 @ 10 @ 60 @ 55 :  
 Cheap, 40 @ 10 @ 60 @ 10 :  
 International Silver Co., 1847 Rogers Bros. and Rogers & Hamilton, 40 @ 10 :  
 Rogers & Bros., William Rogers Eagle Brand, Rogers Brand, 50 @ 10 :  
 Anchor, Rogers Brand, 60 @ 10 :  
 Wm. Rogers & Son, 60 @ 10 :  
 Simeon L. & Geo. W. Rogers Co., Silver Plated Flat Ware, 60 @ 10 :  
 No. 77 Silver Plated Ware, 60 @ 10 :  
**Miscellaneous—**  
 German Silver, 60 @ 60 @ 55 :  
 Cattaraugus Cutlery Co., Yukon Silver, 50 @ 50 :  
 Simeon L. & Geo. W. Rogers Co., German or Nickel Silver, Special list, 40 @ 10 :  
**Tinned Iron—**  
 Teas, per gro. 45 @ 50 :  
 Tables, per gro. 90 @ 1.00 :  
**Springs—Door—**  
 Chicago (Coll), 40 @ 10 :  
 Gem (Coll), 90 @ 10 :  
 Reliance (Coll), 40 @ 10 :  
 Star (Coll), 90 @ 10 :  
 Torrey's Rod, 39 in., 30 @ 10 :  
 Victor (Coll), 50 @ 10 @ 10 :  
**Carriage, Wagon, &c.**  
 34 in. and wider :  
 Black or 1/4 Bright, lb., 44 @ 5 :  
 Bright, lb., 54 @ 5 :  
 Painted Seat Springs :  
 1 1/2 x 22 26, per pr., 60 @ 55 :  
 1 1/2 x 2 x 28, per pr., 60 @ 65 :  
 1 1/2 x 3 x 28 and narrower, per pr., 80 @ 85 :  
**Sprinklers, Lawn—**  
 Enterprise, 25 @ 30 :  
 Philadelphia No. 1, 10 @ 10 : No. 2, 15 @ 10 : No. 3, 24 @ 10 :  
**Squares—**  
 Nickel plated, list Jan. 5, 1900 :  
 Steel and Iron, 10 @ 10 @ 70 @ 10 @ 10 :  
 Rosewood Hdl. Try Squares and T-Bevels, 60 @ 10 @ 10 :  
 Iron Hdl. Try Squares and T-Bevels, 40 @ 10 @ 10 :  
 Disston's Try Sq. and T-Bevels, 40 @ 10 @ 10 :  
 Winterbottom's Try and Miter, 40 @ 10 @ 10 :  
**Squeezers—Lemon—**  
 Wood, Common, gro., No. 0, \$5.25 @ \$5.50 : No. 1, \$5.25 @ \$5.50 :  
 Wood, Porcelain Lined, Cheap, doz. \$1.90 :  
 Good Grade, doz. \$1.75 :  
 Tinned Iron, doz. \$0.75 @ 1.25 :  
 Iron, Porcelain Lined, doz. \$1.75 :  
**Staples—**  
 Barbed Blind, lb. 6 @ 5 :  
 Electricians' Association list, 80 @ 10 @ 10 :  
 Fence Staples, Plain \$2.15 : Galvanized, 2 @ 2 :  
 Poultry Netting, Staples, per lb. \$4 @ 5 :  
 Grand Crossing Tack Co.'s list, 80 @ 10 :  
**Steels, Butchers'—**  
 Dick's, 30 @ 30 :  
 Foster Bros., 80 @ 80 :  
 C. A. Hoffmann's, 40 @ 40 :  
**Steelyards—**  
 Stocks and Dies—  
 Blacksmiths', 40 @ 10 @ 50 :  
 Curtis Reversible Ratchet Die Stock, 25 @ 25 :  
 Derby Screw Plates, 25 @ 25 :  
 Gardner Die Stocks No. 1, 25 @ 25 :  
 Gardner Die Stocks, larger sizes, 40 @ 40 :  
 Green River, 25 @ 25 :  
 Lightning Screw Plate, 25 @ 25 :  
 Little Giant, 25 @ 25 :  
 Reece's New Screw Plates, 25 @ 30 :  
**Stone—**  
**Scythe Stones—**  
 Chicago Wheel & Mfg. Co., 1901 list :  
 Gem Corundum, 10 inch, \$3.00 per gro., 12 inch, \$10.90 :  
 Norton Emery Scythe Stones :  
 Less than gro. lots, 40 @ 40 :  
 One gross or more, 40 @ 40 :  
 Lots of 10 gross or more, 40 @ 40 :  
 Pike Mfg. Co. 1901 list :  
 Black Diamond S. S., 40 @ 12.00 :  
 Lamotte S. S., 40 @ 11.00 :  
 White Mountain S. S., 40 @ 9.00 :  
 Green Mountain S. S., 40 @ 8.00 :  
 Extra Indian Pond S. S., 40 @ 7.50 :  
 No. 1 Indian Pond S. S., 40 @ 7.00 :  
 No. 2 Indian Pond S. S., 40 @ 6.50 :  
 Leader Red End S. S., 40 @ 4.50 :  
 Balance of 1901 list 39 @ 35 :  
**Oil Stones, &c.**  
 Chicago Wheel & Mfg. Co., 1901 list :  
 Gem Corundum Oil, Double Grit, 50 @ 50 :  
 Gem Corundum Axe, Single or Double Grit, 50 @ 50 :  
 Gem Corundum Slips, 50 @ 50 :  
 Gem Corundum Razor Honers, 50 @ 50 :  
 Pike Mfg. Co. 1901 list :  
 Arkansas Stone, No. 1, 3 to 5 in., \$2.90 :  
 Arkansas Stone, No. 1, 5 to 8 in., \$4.00 :  
 Lily White Washita, 4 to 8 in., 60 @ 60 :  
 Rosy Red Washita, 4 to 8 in., 60 @ 60 :  
 Washita Stone, Extra, 4 to 8 in., 60 @ 60 :  
 Washita Stone, No. 1, 4 to 8 in., 40 @ 40 :  
 Washita Stone, No. 2, 4 to 8 in., 30 @ 30 :  
 Lily White Slips, 90 @ 90 :  
 Rosy Red Slips, 90 @ 90 :  
 Washita Slips, Extra, 80 @ 80 :  
 Washita Slips, No. 1, 70 @ 70 :  
 India Oil Stones (entire list), 35 @ 35 :  
**Hindustan No. 1, Regular, 40 @ 40 :  
 Hindustan No. 1 small, 40 @ 40 :  
 Axe Stones (all kinds), 40 @ 40 :  
 Turkey Oil Stones, ex. 5 to 8 in., 40 @ 40 :  
 Quaker Creek Stones, 4 to 8 in., 40 @ 40 :  
 Quaker Creek Slips, 40 @ 40 :  
 Sand Stone, 40 @ 40 :  
 Belgian, German and Swaty Razor Honers, 40 @ 40 :  
 Natural Grit Carving Knife Honers, 40 @ 40 :  
 Quick Edge Pocket Knife Honers, 40 @ 40 :  
 Mounted Kitchen Sand Stone, 40 @ 40 :  
 doz., \$1.50 :  
**Stoners—Cherry—**  
 Enterprise, 25 @ 30 :  
**Stops, Bench—**  
 Millers Falls, 15 @ 10 :  
 Morrill's, 50 @ 10 :  
 Morrill's, No. 2, \$12.50 :  
 Whipple's Combination, 50 @ 10 :  
**Door—**  
 Chapin-Stephens Co., 60 @ 60 @ 10 :  
**Plane—**  
 Chapin-Stephens Co., 25 @ 25 :  
**Straps—Box—**  
 Cary's Universal, case lots, 20 @ 10 @ 10 :  
**Hame—**  
 Covert's Saddlery Works, 60 @ 10 :  
**Stretchers, Carpet—**  
 Cast Iron, Steel Points, doz. 55 @ 60 :  
 Socket, 1.75 @ 1.75 :  
 Excelsior Stretcher and Tack Hammer, 20 @ 20 :  
 Combined, per doz. \$6.00 :  
**Stuffers, Sausage—**  
 Enterprise Mfg. Co., 25 @ 25 @ 7 1/2 :  
 National Specialty Mfg. Co., list Jan. 1, 1904, 30 @ 25 :  
**Sweepers, Carpet—**  
 National Sweeper Co., per doz. :  
 Loyal, Roller Bearing, Fancy Veneers, 25 @ 25 :  
 Marion, Roller Bearing, regular finishes, full Nickel, 24 @ 24 :  
 Marion Queen, Roller Bearing, full Nickel, 24 @ 24 :  
 Monarch, Roller Bearing, Nickel, 22 @ 22 :  
 Monarch, Roller Bearing, Jap. red, 22 @ 22 :  
 Transparent, Roller Bearing, Plate Glass Top, Nickel, 23 @ 23 :  
 Monarch Extra, Roller Bearing, (11-inch case), Nickel, 24 @ 24 :  
 Monarch Extra, Roller Bearing (11-inch case), Japanned, 23 @ 23 :  
 National Queen, Fancy Veneers, 27 @ 27 :  
 Perpetual, Regular Bearings, Nkl, 25 @ 25 :  
 Perpetual, Regular Bearings, Jap, 25 @ 25 :  
 NOTE—Discount of 30 per dozen on three-dozen lots. Discount of \$1 per dozen on five-dozen lots.  
**Tacks, Brads, &c.—**  
 List Jan. 15, '99 :  
 Carpet Tacks, American, 90 @ 25 @ 50 :  
 American Cut Tacks, 90 @ 25 @ 50 :  
 Swedes Iron Tacks, 90 @ 25 @ 50 :  
 Swedes Upholsterers' Tacks, 90 @ 25 @ 50 :  
 Gimbo Tacks, 90 @ 25 @ 50 :  
 Lace Tacks, 90 @ 25 @ 50 :  
 Trimmers' Tacks, 90 @ 25 @ 50 :  
 Looking Glass Tacks, 70 @ 10 @ 10 :  
 Bill Posters and Railroad Tack, 90 @ 25 @ 50 :  
 Hungarian Nails, 90 @ 25 @ 50 :  
 Common and Patent Brads, 80 @ 10 :  
 Trunk and Clout Nails, 80 @ 10 :  
 NOTE—The above prices are for Straight Weights. An extra 35 is given Star Weights and an extra 10 @ 55 on Standard Weights.  
**Miscellaneous—**  
 Double Pointed Tacks, 90 and 6 tens :  
 Steel Wire Brads, R. & E. Mfg. Co.'s list, 50 @ 10 @ 50 :  
**See also Nails, Wire.**  
**Tanks, Oil—**  
 Emerald, S. S. & Co., 60-gal. \$3.25 :  
 Emerald, S. S. & Co., 60-gal., \$4.00 :  
 Queen City S. S. & Co., 60-gal., \$3.65 :  
 Queen City S. S. & Co., 60-gal., \$4.50 :  
**Tapes, Measuring—**  
 American Asses' Skin, 40 @ 10 @ 50 :  
 Patent Leather, 50 @ 50 :  
 Steel, 50 @ 10 @ 10 :  
 Chesterman's, 50 @ 25 @ 55 :  
 Eddy Asses' Skin, 40 @ 10 @ 50 :  
 Eddy Patent Leather, 50 @ 50 :  
 Keuffel & Esser Co., Steel and Metallic, Lower list, 1899, 35 :  
 Lufkin's Steel, 39 1/2 @ 35 :  
 Lufkin's Metallic, 30 @ 30 @ 25 :  
**Teeth, Harrow—**  
 Steel Harrow Teeth, plain or headed, 1/2 inch and larger, per 100 lbs., \$3.00 :  
**Thermometers—**  
 Tin Case, 80 @ 10 @ 30 @ 10 @ 5 :  
**Ties, Bale—Steel Wire.**  
 Single Loop, 80 @ 25 :  
 Monitor, Cross Head, Etc., 70 @ 70 :  
**Brick Ties—**  
 Niagara Brick Ties, 20 @ 10 :  
**Tinners' Shears, &c.—**  
 See Shears, Tinner's, etc.  
**Tinware—**  
 Stamped, Japanned and Placed, sold very generally at net prices.  
**Tips, Safety Pole—**  
 Covert's Saddlery Works, 60 @ 10 :  
**Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.****



**Tools—Coopers'—**

L. &amp; J. White Hay—.....30@90&amp;55

Myers' Hay Tools.....50%  
Stowell's Hay Carriers.....50%  
Stowell's Hay Forks.....50%  
Stowell's Fork Pulleys.....50%**Saw—**  
Atkins' Cross Cut Saw Tools.....40%  
Simonds' Improved.....33%  
Simonds' Crescent.....25%**Ship—**  
L. & J. White.....25%**Transom Lifters—**  
See Lifters, Transom.**Traps—Fly—**Balloon, Globe or Acme.....  
doz. \$1.15 to 1.25; gro. \$11.50 to 12.00  
Harper, Champion or Paragon.....  
doz. \$1.25 to 1.40; gro. \$13.00 to 13.50**Game—**Oneida Pattern.....\$30.00 to 35%  
Newhouse.....45% to 55%  
Hawley & Norton.....65% to 75%  
V.O. (Oneida Pattern).....75% to 85%  
O.C. Jump (Blake Pattern).....65% to 80% to 10%**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes.....8% to 9%

Mouse, Round or Square Wire.....  
doz. 85% to 90%**Marty French Rat and Mouse Traps**  
(Genuine):No. 1, Rat, Each \$1.15; doz. \$13.00  
No. 3, Rat, doz. \$6.00; case of 50  
\$25.25 doz.No. 3 1/2, Rat, doz. \$4.75; case of 75  
\$14.25 doz.No. 4, Mouse, doz. \$3.50; case of 7  
\$2.75 doz.No. 5, Mouse, doz. \$2.75; case of 150  
\$2.25 doz.Schuyler's Rat Killer, No. 1, doz. \$30.00  
No. 2, doz. \$30.00; Mouse, No. 3,  
\$15.00 doz.

J. M. Mast Mfg. Co., Per gro.....50%

**Mouse Rat**

Blizzard.....No. 12, \$3.00 No. 1, \$3.50

Old Nick.....No. 20, 2.22 No. 2, 3.40

Joker.....No. 5, 2.10 No. 3, 3.40

Imp'd Snap Shot, Mouse, per gro., 2  
hole \$2.40mp'd Snap Shot, Mouse, per gro., 4  
hole \$4.20**Trimmers Spoke—**

Bonney's No. 1 and 2.....33% to 35%

Wood's A. I.....30%

**Trowels—**

Diston Brick and Pointing.....30% to 35%

Diston Plastering.....25%

Diston "Standard Brand" and Gar-  
den Trowels.....35%Kohler's Steel Garden Trowels, 5 in.,  
per doz. \$5.00Kohler's Steel Garden Trowels, 6 in.,  
per doz. \$6.00Never-Break Steel Garden Trowels.....  
per doz. \$5.00

Rose Brick and Plastering.....25%

Woodrough &amp; McFarlin, Plastering.....25%

**Trucks, Warehouse, &c.—**

E. &amp; L. Stock Co.

New York Pattern.....50% to 10%

Western Pattern.....50% to 10%

Handy Trucks.....per doz. \$16.00

Grocery.....per doz. \$15.00

Daisy Stove Trucks, Improved pattern  
per doz. \$18.50

Model Stove Trucks.....per doz. \$18.50

**Tubs, Wash—**

Galvanized, per doz. \$5.00 5.50 6.25

Galvanized Wash Tubs (S. S. &amp; Co.):

No. 1, 2 3 10 30 80

Per doz., net \$5.70 6.50 7.30 8.10 9.10

**Twine—Miscellaneous—**

Flax Twine—BC B

No. 2, 1/4 and 1/2 lb. Balls.....80% to 85%

No. 12, 1/4 and 1/2 lb. balls.....16% to 18%

No. 13, 1/4 and 1/2 lb. Balls.....14% to 16%

No. 24, 1/4 and 1/2 lb. Balls.....14% to 16%

No. 36, 1/4 and 1/2 lb. Balls.....13% to 15%

**White Lead, Zinc, &c.**

Lead, English white, in Oil.....8% to 9%

Lead American White, in Oil:

Lot of 500 lb or over.....6% to 7%

Lots less than 500 lb.....6% to 7%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Lead, White, in Oil, 1 1/2 in. tin.....6%

Chalk Line, Cotton, 1/4 lb.....25%

Balls.....25%

Cotton Mops, 6, 9, 12 and 15 in., to  
doz.....25% to 10%Cotton Wrapping 5 Balls to lb.....  
according to quality.....15% to 22%American 2-Ply Hemp, 1/4 and 1/2 lb.  
Balls.....15% to 14%American 3-Ply Hemp, 1-lb. Balls.....  
15% to 14%India 2-Ply Hemp, 1/4 and 1/2 lb.  
Balls (Spring Twine).....9%

India 3-Ply Hemp, 1-lb. Balls.....9%

India 3-Ply Hemp, 1-lb. Balls.....9%

2, 3, 4 and 5-Ply Jute, 1/2 lb. Balls.....  
9% to 10%

Mason Line, Linen, 1/2 lb. Balls.....16%

No. 26, Mattress, 1/4 and 1/2 lb. Balls.....  
37% to 60%

Wool, 3 to 6 ply.....5% to 6%

**Vises—**

Solid Box.....50% to 60%

**Parallel—**

Athol Machine Co:

Simpson's Adjustable.....40%

Standard.....40%

Amateur.....25%

Bonney's.....33% to 40%

Columbian Haw. Co.....40%

Emmert Universal:

Pattern Makers' No. 1.....\$15.00

Pattern Makers' No. 2.....\$12.50

Machinist and Tool Makers' No. 4, \$12.50

Fisher &amp; Norris Double Screw.....15% to 10%

Holland's:

Machinists.....40% to 45%

Key-stones.....65% to 70%

Lewis Tool Co.....20% to 30%

Merrill's.....20%

Miller's Falls.....60% to 10%

Parker's:

Victor.....20% to 25%

Regulars.....20% to 25%

Vulcan's.....40% to 45%

Combination Pipe.....55% to 60%

Prentiss.....20% to 25%

Sargent's.....40%

Smith &amp; Hemenway Co.:

Machinists.....40%

Jewellers.....33% to 40%

Snediker's X. L.....33% to 40%

Stephens.....33% to 40%

**Saw Filers—**

Bonney's No. 1, \$13; No. 3, \$16.....40%

Diston's D S Clamp and Guide, per doz.  
\$30.....25%

Perfection Saw Clamps, per doz.....\$8.00

Wedding's Rubber Jaw, Nos. 1, 2  
and 3.....45% to 50%**Wood Workers—**Wyman & Gordon's Quick Action, 6  
in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.**Miscellaneous—**Signal & Keefer Combination Pipe  
Vise.....40%

Holland's Combination Pipe.....60% to 65%

Parker's Combination Pipe.....60%

187 Series.....60% to 65%

No. 870.....60% to 65%

**Wads—Price Per M.**

B. E., 11 up.....60%

B. E., 9 and 10.....70%

B. E., 8.....80%

B. E., 7.....80%

P. E., 11 up.....1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger.....\$1.70 to 1.75

Ely's P. E., 12 to 20.....\$3.00 to 3.50

**Ware Hollow—**

Cast Iron, Hollow—

Stove Hollow Ware:

Enameled.....55% to 60%

Ground.....60% to 65%

Plain or Unground.....65% to 70%

Country Hollowware per 100 lbs., \$2.50

White Enameled Ware:

Maslin Kettles.....70%

Covered Ware:

Tinned and Turned.....40%

Enameled.....50%

See also Pots Glue.

**Enameled—**

Agate Nickel Steel Ware.....50% to 20

Agate Nickel Steel Ware, Specials.....  
60% to 15%

Iron Ware.....70% to 10%

Lava, Enameled.....40% to 10%

Never Break Enameled.....50%

**Tea Kettles—**

Galvanized Tea Kettles:

Inch.....6 7 8 9

Each.....45c 50c 55c 65c

**Steel Hollow Ware.**

Avery Spiders &amp; Griddles.....55% to 55%

Avery Kettles.....60%

Porcelain.....50% to 50%

Never Break Spiders and Griddles.....  
60%**Washboards—**

Solid Zinc

Crescent, family size, bent frame, \$3.00

Red Star, family size, stationary  
protector.....\$3.00

Double Zinc Surface:

Saginaw Globe, family size, station-  
ary protector.....\$2.85Cable Cross, family size, stationary  
protector.....\$2.90

Single Zinc Surface:

Nalad, family size, open back perfor-  
ated surface.....\$2.40Saginaw Globe, protector, family  
size, ventilated back.....\$2.25

Brass Surface:

Back King, Single Surface, open  
back.....\$3.00

Nickel Plate Surface:

No. 1001 Nickel Plate, Single Surface  
.....\$3.00**Washers—**

Leather, Axle—

Solid.....80% to 100% to 100% to 10%

Patent.....45% to 50% to 50% to 5%

Coil:

1/4 1/2 3/4 1 1 1/2 1 3/4 2 2 1/2 3 3 1/2

In lots less than one key add 1/2c per  
lb., 5-lb. boxes add 1/2c to list.**Cast Washers**Over 1/2 inch, barrel lots, per lb.....  
1 1/4 to 2c**Waterers, Hog—**

Improved Dewey, per doz.....\$13.00

**Wedges—**

Old Finish.....lb. 2.90 to 3.00c

**Weights—**

Hitching—

Covert's Saddlery Works.....60% to 10%

**Sash—**

Per ton, f.o.b. factory:

Eastern District.....\$26.00

Western, Central and Southern  
Districts, market unsettled.

Prices ranging from \$21.00 to 26.00

**Wheels, Well—**

8-in., \$1.60; 10-in., \$2.00 to 2.25;

12-in., \$2.50 to 2.65; 14-in., \$4.00 to 4.25

**Wire and Wire Goods—**

Bright and Annealed:

6 to 9.....7 1/4 to 10 to 7 1/4 to 10 to 5 1/2

10 to 18.....7 1/4 to 10 to 7 1/4 to 10 to 5 1/2

**Animal, Fish and Vege-**

table Oils.

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

Lined, City, raw.....gal. 37 @ 38

**PAINTS, OILS AND COLORS.**

Green, Chrome, pure.....17 @ 25

Lead, Red, bbls., 5 bbls. and kegs:

Lots less than 500 lb.....6% to 7%

Litharge, bbls., 5 bbls. and kegs:

Lots less than 500 lb.....6% to 7%

Ocher, American.....\$5.50 to \$6.00

Orcher, American Golden.....25% to 30%

Orcher, French.....15% to 25%

Orcher, Foreign Golden.....30% to 40%

Orange Mineral, English.....\$9 @ 11

Orange Mineral, French.....10% to 11%

Orange Mineral, German.....8% to 9%

Orange Mineral, American.....7% to 8%

Red, Indian, English.....4% to 5%

Red, Indian, French.....4% to 5%

Red, Turkish, English.....4% to 5%

Red, Tuscan, English.....4% to 5%

Red, Venetian, Amer. \$100 B.....50% to 150%

Red Venetian, English \$100 B.....1.25 to 1.75

Sienna, Italian, Burnt and  
Powdered.....3 @ 6 1/4

Sienna, Ital., Raw, Powd.....3 @ 6 1/4

Sienna, American, Raw.....1 1/2 @ 2

Sienna, American, Burnt and  
Powdered.....\$14 @ 2

Talc, French.....\$14 @ 2

Talc, American.....\$14 @ 2

Terra Alba, French \$100 B.....95 @ 100

Terra Alba, English.....95 @ 100

Terra Alba, American No. 1.....65 @ 85

Terra Alba, American No. 2.....45 @ 50

Umber, Turkey, Bnt. &amp; Powd.....2 1/2 @ 3 1/4

Umber, Bnt. Amer.....1 1/2 @ 2 1/4

Umber, Raw Amer.....1 1/2 @ 2 1/4

Yellow, Chrome.....11 @ 14

Vermilion, American Lead.....10 @ 25

Vermilion, Quicksilver, bulk.....@ 70

Vermilion, Quicksilver, bags.....@ 71

Vermilion, English, Import.....80 @ 85

Vermilion, Chinese.....\$0.90 to 1.00

**Colors in Oil.**

Black, Lampblack.....12 @ 14

Blue, Chinese.....35 @ 46

Blue, Prussian.....32 @ 36

Blue, Ultramarine.....13 @ 16

Brown

JANUARY 20, 1904.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

Nov. 25	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340
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Burnt Iron..... \$ Gross ton \$6.000